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WEDNESDAY, JULY 7, 1920.

Vol. XIX. No. 1.

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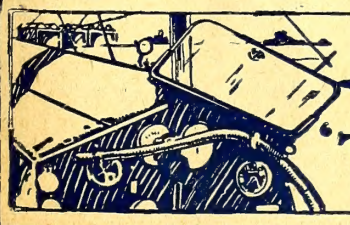

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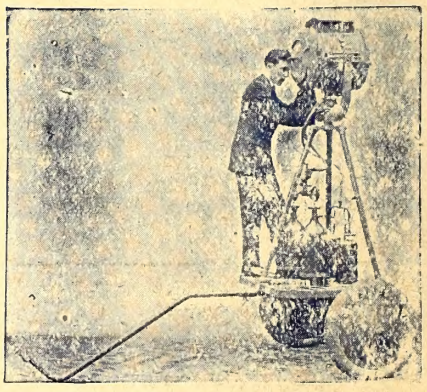

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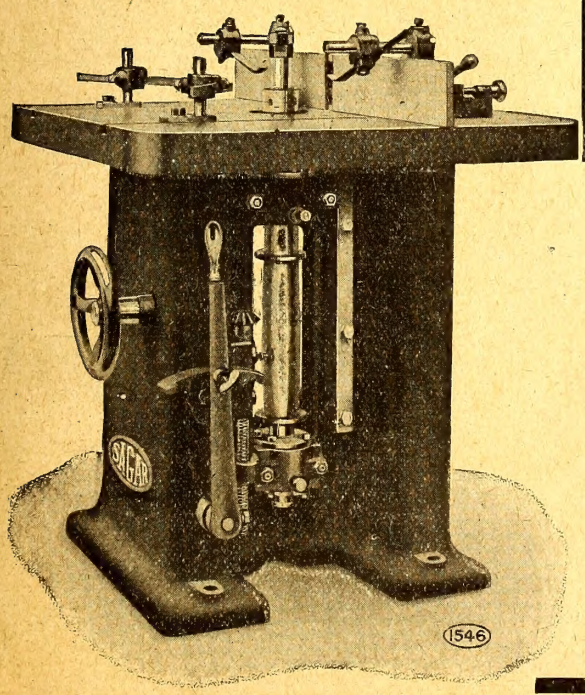

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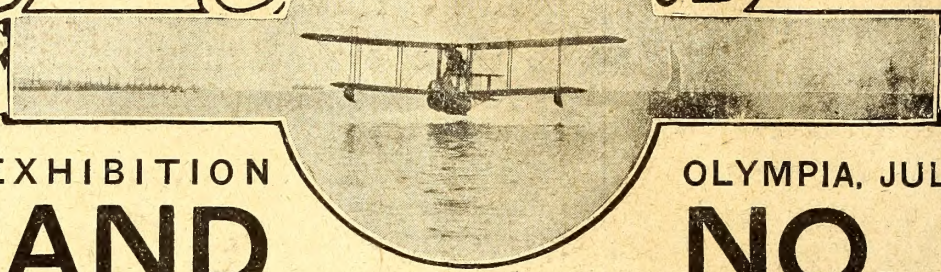

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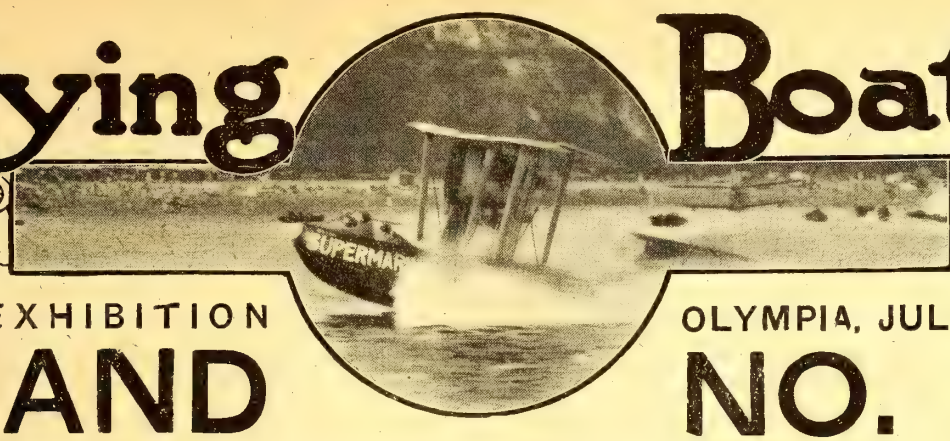

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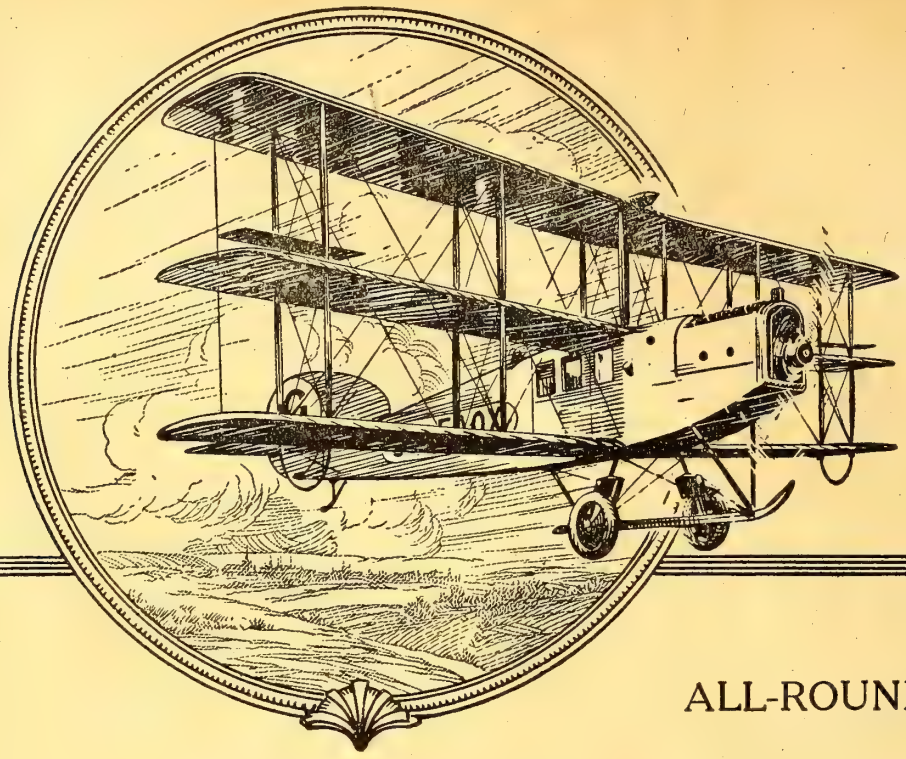

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THE AEROPLANE

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ON THE R.A.F. TOURNAMENT.

Two things appear certain after the R.A.F. Tournament on Saturday last, July 31d. One is that the R.A.F. Tournament will be an annual social event of considerable importance in the London Season. The other is that those newspaper proprietors and editors who believe that the British Public is not interested in aviation are truly representative of the journalistic trade, a trade which has shown real genius in misrepresenting and misunderstanding public opinion.

The record attendance at the Hendon Aerodrome prior to last Saturday was, one believes, about 60,000 people, on the occasion of the Aerial Derby of 1914. At a rough guess one would estimate the crowd at the R.A.F. Tournament at 40,000. It was as long as the record Aerial Derby crowd, but it could not have been as deep. One hopes that the guess is an under-estimate, for the R.A.F. Memorial Fund will be the more benefited if the figure is higher.

The proprietors of the Hendon Aerodrome, who kindly lent the ground for the occasion, must have received a rude shock when they saw the vast mob which arrived, for they must have appreciated fully for the first time the mistake they made in not running the aerodrome last year and this year on the sound lines laid down by the late Richard Gates in 1912-13 and 14. One can imagine Richard's joy on Saturday at seeing Hendon not merely back to its old form, but far in front of it, both in the quality of the flying and the quality if not the quantity of the crowd.

[Since these notes were written it has been stated that the Air Ministry estimates that 40,000 people paid for admission at the gates (presumably exclusive of those who bought tickets beforehand), and that the R.A.F. Memorial Fund will be £6,000 to the good after paying all expenses.]

The Sound British Public.

The huge success of the whole affair bears out fully the theory which one has set forth in this paper on previous occasions, namely, that the British Public will be enthusiastic over the best of everything or over the worst, but it has no use for mediocrity. A seaside holiday crowd at a promenade concert will applaud Wagner to the echo, and it will be nearly as pleased with the latest "rag," but it has little use for Cyril Scott and his like. Mr. Kipling and Mr. Garvice are alike "best sellers," but a merely clever book has only a small sale. "Cyrano de Bergerac" will fill a theatre even better than "A Little Bit of Fluff," but a play that is just "smart" has a short run.

And, similarly, the R.A.F. Tournament can fill Hendon with a crowd as big as would go there if the management guaranteed three fatal accidents, but the crowd will not go to see a few second-rate stunt pilots and some poorly arranged races on training machines. One hopes that this fact may be duly digested by the Royal Aero Club when it comes to carrying out the arrangements for the Aerial Derby for July 24th.

The most encouraging feature about that huge crowd was that it arrived purely as the result of real interest in and enthusiasm for aviation. The daily Press had done little or nothing to stir up enthusiasm beforehand. What little was published on the subject was either unintelligent or unintelligible. Apparently the crowd was drawn simply by one enthusiast telling other enthusiasts that it would be the proper thing to go to Hendon, and the other enthusiasts passing the enthusiasm on to others, and so on and so forth on the "snowball" principle. Personally, one is not surprised, for one never doubted the public's interest in flying, if given the opportunity of seeing flying done as it should be.

Deserved Congratulations.

The whole of the R.A.F. deserves the most cordial congratulations on the good work it has done in thus demonstrating the good sense of the British Public and in providing the finest exhibition of flying ever seen in this country or elsewhere.

From Air Vice-Marshal Sir John Salmond, who worked his hardest to make the display what it was—which entailed a huge amount of overtime on top of his usual onerous duties—to the most junior air mechanic who handled the machines on the great day, everybody deserves the most sincere congratulations on the success which they both earned and commanded. Moreover, they deserve to be publicly thanked for their services not only to the R.A.F. Memorial Fund but to the progress of aviation, which is ultimately a far greater matter.

A Few Grouses.

Of course, there is no rose without a thorn, so one may as get off one's chest at the start a few complaints, which one hopes will not be regarded merely as grousing but as suggestions for future Tournaments.

First of all, one suggests that next year's tournament be held at Croydon. It is a better and more pleasant aerodrome. It is far easier to reach by rail and tram from every direction—it will have an electric railway to its gates in less than a year. It can be approached by several roads instead of by two only.

The R.A.F. certainly handled the car traffic at Hendon wonderfully well on Saturday. One doubts whether even the wonderful French traffic-control gendarmerie—of whom Mr. Henry Knox remarked that they are guaranteed to pass more camels per minute through the eye of any given needle than anybody else in Creation—could have done much better. But there is need for a more accessible aerodrome.

Secondly, one objects strongly to the Tournament being called a Pageant. The latter title suggests the state entry of the Air-Marshal, followed by serried ranks of Air Vice-Marshals, Air Commodores and Group Captains; and a Battalion of Flying Officers representing "Air Force Uniforms Throughout the Ages" (1914-1920); and motor lorries representing the work of the R.A.F., such as a group of Equipment Officers dissecting an obturator

ring and a group of A.I.D. officials putting the official stamp on a sparking-plug washer; what time the R.A.F. Band plays Miss Lee White's famous song, "And I'm Blew Tew."

The good old word Tournament suffices for the Navy and Army. One would prefer it for the R.A.F.'s annual display, apart from the fact that it describes more accurately the nature of the events and is less grandiose.

Sir Eric Geddes might like a Pageant, but a Tournament is more in keeping with Mr. Churchill's Department, and his fondness for jousting, verbal or real.

Thirdly, one submits that the management made a mistake in permitting a woman to do a parachute drop from a Service machine. One acknowledges fully the pluck of Miss Sylvia Boyden, and one recognises the fact that she is an amateur parachutist, but one believes that the performance was out of place.

If a parachute drop had to be done it should have been done by an R.A.F. officer or airman. At the Naval and Military Tournament one does not witness the sight of a young and beauteous lady pirouetting gracefully on the fat back of a cavalry charger as it canters round Olympia.

The Matter of Starting.

Fourthly, the machines should not be allowed to take off towards the crowd, for many reasons. If an engine failed just when it was coming up to the crowd either it would have to land in the middle of the people or do a flat spin and crash itself. Even when the machines get away perfectly, as did every machine on Saturday, thanks to the wonderful R.A.F. mechanics, they cause a trifle too much emotion to many of those who are watching them from a few feet below. Only the uninitiated or the foolhardy are completely unmoved.

Long before the War the competitors in the races at Hendon always started in the same direction (namely, parallel to the crowd), regardless of the direction of the wind or the speed, or slowness, of their machines. Surely the skilled pilots of the R.A.F. can do likewise. Not only is it safer, but it looks better.

The Worst Objection.

Fifthly and lastly, one objects most strongly to the statements in the programme after the names of certain gallant officers to the effect that one or other of them had destroyed so many German aeroplanes and/or balloons. At the Naval and Military Tournament one does not read in the programme concerning, say, the Sabre *versus* Bayonet Competition :— Sabre—Squadron-Serjt.-Major Jones (*clave seventeen Germans to the chine*) *versus* Bayonet—Platoon-Serjt. Smith (*prodded fifteen Germans in the peritoneum*).

It simply is not done. One can only assume that those responsible for the programme made the fatal mistake of allowing either a journalist or a publicity expert to have a finger in the pie of its composition, and that the proofs were not submitted to the High Command of the R.A.F. before the bulk was printed. The class of person who went to the Tournament does not need the vulgarity which attracts the daily Press to attract him or her to the R.A.F.'s annual display. One hopes that in future the R.A.F. will not be guilty of such a *bêtise*.

Having thus relieved one's soul of all its complaints, let us to the affair in hand—the gay and gallant joustings of the gentlemen of His Majesty's Royal Air Force.

No attempt has been made to illustrate the events by means of photographs. All the machines, except the S.E.5b, have been illustrated over and over again in this paper. Photographs of personalities are either an impertinence or a bore. And it is impossible to do justice to formation or aerobatic flying in photographs. Therefore one has limited the illustrations to a few clever sketches kindly contributed by Mr. Sinclair Puckett, late R.A.F. They convey the spirit of the whole affair better than any photograph could do.

The Events of the Day.

Perhaps the most striking feature of the whole performance was the military precision with which the events were run. It was only necessary to look at an accurate timepiece and then at the programme to know what event was in progress.

The first event, a race for standard Avro training machines, started at the stroke of 15 o'clock. It seemed rather a dangerous affair, in that the competitors were lined up head to wind, which meant head to the crowd, with cold engines; the pilots and mechanics were in line 20 yards behind the machines, and at the starting signal had to rush for the machines, start them up, and get off. It speaks wonders for the excellence of the mechanics and the good sense of the pilots that, despite the hustle and hurry, each and every engine was firing perfectly as it passed overhead, certainly not higher than 30 feet.

The race was won in a canter by Flt. Lieut. Weare, M.C., who got away several seconds in front of the rest, and held his lead all the way out to the turning point and back. He is to be particularly congratulated on his crew of mechanics, who evidently keep his engine in perfect condition, for it started at the first pull over.

An Ill-Matched Pair.

The second event was a fight between a Fokker and a Martinsyde. It was, in fact, the least good show of the day. The Fokker could never get within shooting distance of the "Tinsyde," because of the superior speed of the latter, and the pilot of the "Tinsyde" never made a serious attempt to get onto the Fokker's tail, probably recognising the fact that if he did so the Fokker could always dodge him.

As a matter of fact, a fight between a Fokker and a Martinsyde is impossible, and rather like a duel with "boxing gloves at a hundred yards," unless each pilot resolves to hit the other regardless of consequences, and so makes no attempt to escape being hit himself. The Martinsyde always has superior speed and the Fokker always has greater manœuvrability.

Trick Flying as Done.

The next event was one of the best of the day. Flight Lieut. Noakes, A.F.C., M.M., one of the old N.C.O. pilots of the McCudden period, if one is not mistaken, put up a perfectly wonderful show on an S.E.5b., a machine which has not hitherto been seen in public. It is a variant of the popular S.E.5a., and looks rather like an S.E. fuselage and undercarriage with a Hun nose.

Mr. Noakes took it off sideways to the wind and sideways to the ground also, a fearsome trick that made it seem as if he had caught his wing-tip in something at the moment of lifting. Then he waggled the machine in the opposite direction, doing a species of quarter spin, absolutely flat. After which he proceeded to do everything that an aeroplane can do, including a roll at the top of a loop, which very few pilots or machines can manage with such absolute precision.

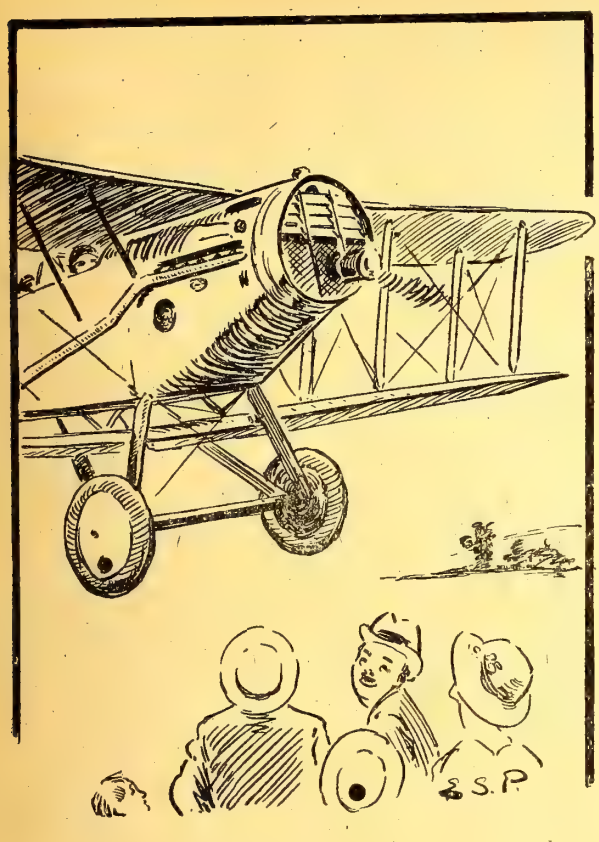
He is hardly so clever an exhibition pilot as Major Draper, perhaps, for he keeps a shade too close to the audience when performing, and he is inclined to be brusque in his movements. And nobody, in the opinion of many good judges, has ever touched the late Peter Legh for sheer artistry in the air, except, perhaps, Roland Garros. But Mr. Noakes is a very fine pilot indeed, and if he laid himself out to be an exhibition pilot, which is quite a different thing from either a test pilot or a stunt pilot, he would find very few to beat him.

Aerial Harmony.

The fourth event, a demonstration of formation flying by five Bristol Fighters, was perhaps the finest show of pure flying of the day. Squadron Leader E. H. Johnston, O.B.E., and four of his officers gave a delightful exhibition, which compared in neatness with a musical ride at the Military Tournament. Granted that these officers had what is perhaps the most graceful-looking machine in the world to fly, and had, in their Rolls-Royces, engines which could be throttled to a revolution to get uniform speed in all machines, and granted that all the machines were equipped with wireless telephones so that the pilots were manœuvring to word of command like a platoon of infantry; with all these advantages duly considered, the Bristols did everything that could be expected of them.

One hopes next year to see Squadron Leader Johnston manœuvring a full squadron, so that not only can individual machines change places, circle about, and fall into position again, but each flight can manœuvre as a unit in co-operation with the others. There are great opportunities for effective displays of this nature. And this was a very fine example of what can be done.

Following on the Bristol show came a display by five



Confidence "Takes off well, doesn't she?"

Sopwith "Snipes," led by Flight-Lieut. J. S. T. Fall, D.S.C., A.F.C. This also was a very fine exhibition, though the Snipes, not being fitted with telephones, did not manœuvre with the apparent unanimity of the Bristols. Having to depend on visual signals there was inevitably a lag between the movements of the leader and those of the other four. Moreover, No. 5 of the formation was suffering from a rather reluctant engine, and so could not keep quite level with the movements of the others.

Nevertheless the simultaneous looping and Immelmanning and so forth was distinctly pretty. The only defect about the performance was that the formation, like Mr. Noakes, kept too far towards the west, and so the end man was flying over the heads of the crowd, which prevented one from getting the whole formation into the area of one's vision at the same time. As in the case of Squadron Leader Johnston, one hopes to see Mr. Fall next year, complete with telephones and with a whole squadron behind him. He is certainly a very able leader and organiser.

The Gentle Aviator.

The sixth event was an exhibition of flying on a Sopwith Camel by Flight.-Lieut. Longton, and a very pretty exhibition it was. One has never seen anybody, except Peter Legh, keep a machine on its back for so long. And he did all his loops and rolls so slowly and gracefully that he reminded one of Tom Hearne, the "Lazy Juggler." Mr. Longton must have beautiful hands, for at no time did his machine perform a jerky movement, and it all seemed so leisurely that one perceived at once that the machine was under the control of an artist.

His one fault was that, like many other performers, he kept so close to the audience that it gave one a crick in the neck to watch him. He will, one hopes, take this criticism in the friendly spirit in which it is meant. His flying is so good that one wants to see all of it in the most convenient way, so that one can appreciate it to the full.

The Gambols of Giants.

After Mr. Longton came a display by three four-engined Handley Pages of the V/1500 type. The three vast beasts rolled out across the aerodrome looking like performing elephants. Then they turned and swept towards the crowd as if to demolish the enclosures and all that was therein. It was truly a terrifying sensation as the twelve Rolls-Royce Eagles roared towards the railings. Even Air-Commodores in the cattle-pens called boxes, and war-stained Squadron-Leaders in the enclosures behind them, turned pale, and one confesses to heaving a sigh of relief when Squadron-Leader Sholto Douglas's tail-skid passed innocuously some fifteen feet or so above one's head.

The "Super-Handley," as it is generally called, is not exactly a machine for trick flying, but several times the three did turns with distinctly perceptible banks, and changed direction within the confines of the aerodrome.

From one of the three Miss Boyden made her descent in a red-white-and-blue "Guardian Angel" parachute, which opened with the precision always associated with Mr. Calthrop's products. The inappositeness of the occasion in no way detracts from one's admiration of Miss Boyden's pluck or of the excellence and reliability of the parachute itself.

A Nieuport "Night-Hawk" and a "Snipe" went up at the same time as the "Super-Handleys," and proceeded to fly round, under and over them, like porpoises playing round a whale. It was a pretty sight, and all the machines were excellently handled.

A Real Fighter.

Thereafter a Bristol Fighter, piloted by Flight.-Lieut. K. M. St. C. G. Leask, M.C., with Flying Officer H T. Pemell as gunner-observer, went up and was attacked by two Snipes, piloted by Flight-Lieut. A. Coningham, D.S.O., M.C., D.F.C., and Flying Officer G. E. Gibbs, M.C. It was a very good show. Mr Leask had at least as many defensive tricks as he has initials. Never once, so far as one could see, did either Snipe get fairly on his tail. Over and over again when one of them looked like doing so Mr. Leask would stall or side-slip, and leave the Snipe in such a position that Mr. Pemell's gun could make things distinctly unpleasant for the enemy. One imagines that during the war Mr. Leask must have been singularly popular with his observers.

Incidentally the whole fight took place right away over by the railway embankment, so that one could watch every twist and turn of it with absolute comfort. For which relief much thanks.

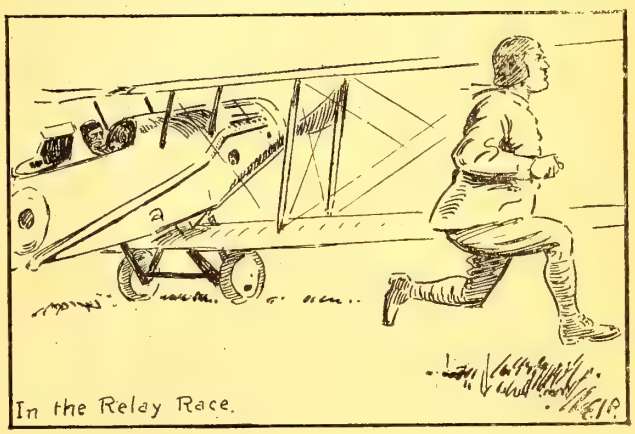
The Sporting Event.

Following this event there was a relay race between teams representing Uxbridge, Kenley, Andover, Netheravon, Upavon, Duxford, and Gosport, for a cup presented by the Viscount Northcliffe. Each team consisted of an Avro, a Bristol and a Snipe. At the signal the Avro of each team started (straight for the crowd, as usual) and flew to a point about Wembley, then down wind to Bittacy Hill, and so back to the aerodrome, where it had to land behind its team-mates. If it ran over the line it had to be hauled or taxied back. On its coming to rest the Bristol started and repeated the performance, and on its finishing the Snipe did the same thing, only varying it by landing closer to the railing for the finish.

The Kenley team won hands down. Flight-Lieut. Salt was off the ground on his Avro before most of the others had got their engines going. He landed close up to Flying Officer Luxmore's Bristol, which was well away before the next Avro had even touched the ground. He in turn dumped his machine down behind Flight-Lieut. Chappell's Snipe before the next Bristol was over the aerodrome. And Mr. Chappell had landed when his nearest competitor was somewhere between Bittacy and the railway.

Not only did the Kenley machines get away quicker than the others, but they seemed faster in the air. Presumably their superiority is explained by the need for overcoming the natural beastliness of the Kenley area by having engines on which pilots can absolutely depend. One recommends that lazy engine mechanics be sent to Kenley and taken up as passengers over the surrounding hills, valleys and forests twice a day until they appreciate the need for reliable engines.

The race itself was very good fun, and great was the excitement as the six Snipes streaked overhead with their



In the Relay Race.

fifteen hundred horse power or so howling in pursuit of the Kenley machine. The relay race idea is worth developing on a bigger scale next year.

Civilian Competition.

Following the Relay Race came a very pretty exhibition by Mr. Hawker on the Sopwith "Swallow," erstwhile known by the less dignified name of the "Scooter." It is an aged "Camel" fuselage with a single plane above it, making it a "parasol" monoplane. Mr. Hawker is essentially a test pilot and flies as such. His movements are quick without being jerky or clumsy. The "Scooter" rolls more quickly than anything one has seen, and it spins like a tee-to-tum.

The show was distinctly good, and Mr. Hawker deserves the more thanks in that he injured his back some years ago in a crash and has only quite recently been under treatment for this old injury. Really he should not have been flying at all.

An Unintended Thrill.

After this show came an event which caused some considerable thrill. A dilapidated kite-balloon was sent up and Flt. Lieut. Hazell, D.S.O., M.C., D.F.C., gave an exhibition of attacking it. According to the programme the balloon was to burst into flames (it did not say it was to be *shot* down), and a dummy observer was to descend by parachute. Unfortunately only some 7,000 programmes were available, and they were all sold by 15 o'clock. Newspaper rumour had it that a real live parachutist was to do the jumping. And quite a lot of silly people believe what they read in newspapers, even in technical papers. Consequently some 30,000 people thought that the parachutist was alive.

The balloon duly ascended, despite a smart shower which caused a distinguished young Australian squadron-leader to remark, "What a pity! It will wet the gas and then it won't burn." Mr. Hazell duly flew round and let off some cartridges, which if they had been "live" would have exterminated a few of the crowd. The balloon duly caught fire and fell. Then the observer fell through the bottom of the basket. And his parachute stuck.

He was a horribly realistic dummy, and even experienced R.A.F. people, both practical and technical, who were not in the know, swore that he was a real man struggling to free himself. He fell behind the brow of the hill inside the aerodrome, just where one has seen so many aeroplanes crash, leaving one in doubt whether the pilot was alive or dead till one had topped the rise. And the blazing remnants of the balloon fell right on top of him.

Immediately the crowd in the shilling enclosures at the north end of the ground made a rush, like an enormous coroner's jury dashing off to view the corpse. Almost as quickly a dozen or more officers and airmen from the place where the machines were parked dashed out and headed off the crowd. A Hucks-Ford engine-starter and an R.A.F. van of some sort, apparently an ambulance, shot out after them, and drove up and down in front of the mob, forcing them still farther back. Then the comic jazz biplane—of which more hereafter—taxied along the line, brushing the people back with its inner wing-tip.

It was as smart a piece of work and as fine a display of initiative as one has seen for a long time, for the R.A.F. had made no arrangements to handle a big crowd, even behind railings let alone when loose on the aerodrome. This little rounding-up performance was by no means the least meritorious of the afternoon.

Somebody seems to have been trodden-upon in the rush, for the ambulance took a man to the first-aid hut soon after, and, of course, the yarn got around that this was the bumped and burnt observer from the kite-balloon. So some of the crowd went home with the soul-satisfying conviction that they had seen a man very nearly killed, and so felt they had had really good value for their money. But, be it said, the great majority of those present were not of that class, and some of those who were really upset by the affair were greatly relieved to learn the truth from those who were among the 7,000 programme owners. As a matter of fact, the authorities might well have printed programmes for 47,000.

A Different Thrill.

Following the balloon episode Squadron Leader Johnston and his Bristols did an attack in line-abreast on an imitation trench, which blew up with great enthusiasm just after they had passed over it. The effect was distinctly good, and might well be repeated with elaborations next year. For example, we might have a dummy town. And we might have small but noisy bombs.

Barm in Gilead.

The next event was a very impressive affair. Squadron Leader J. K. Wells, piloted by Flight Lieut. C. A. Rea, A.F.C., went up in a Handley Page of the old O/400 type and dropped bombs which burst in the air like maroons. From the bursts there arose masses of fat greasy white smoke, which effervesced and fermented and seethed and rolled over itself like yeast, more commonly called barm in the North Country, in a brewer's vat. Which may possibly explain why the chief expert in this species of chemical frightfulness rejoices in the nickname of "Barmy."

Anyhow, the bombs made a splendid smoke-screen in the air, which hung there for quite a while, and effectively shut out the view of the people with free-gratis hedge-tickets at Hendon and Mill Hill. It is a pity the show did not begin with this "turn."

Thereafter "thermit" bombs were dropped in strings on the ground, where they demonstrated very convincingly how enemy crops might be destroyed, except in the British Isles, where our crops are invariably too green to burn—like the readers of some papers which one could mention.

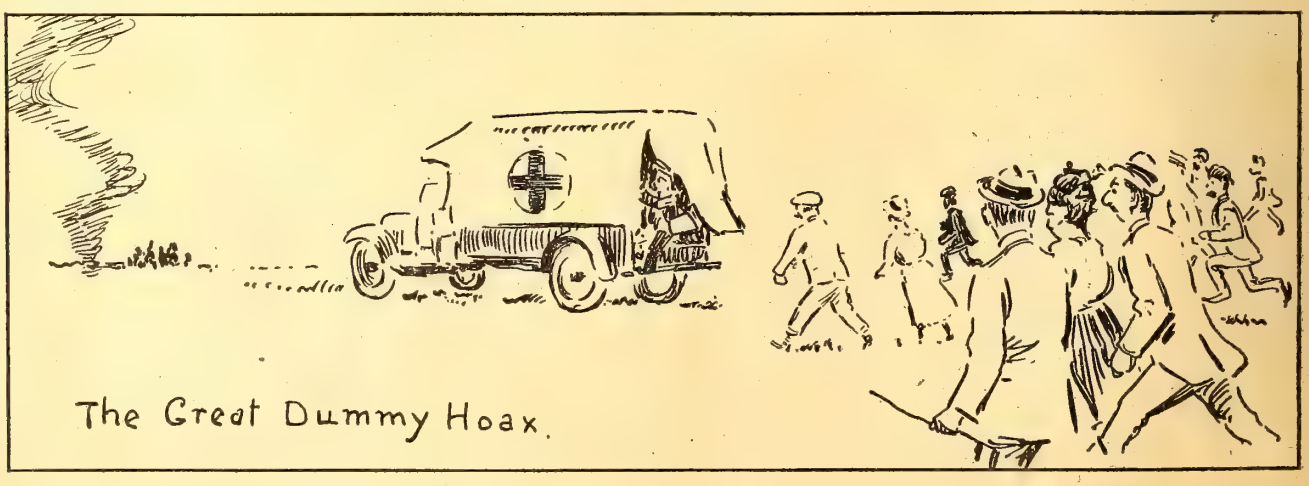
Meantime Messrs. Hazell, Coningham and Gibbs, on Snipes, played follow-my-leader in and out of the smoke-cloud and round about the sky generally. And after that we all went home, laboriously and with much delay, being more than a little impeded by dozens of cars which were unable to get into the grounds at all.

One believes that at 16 o'clock there was still a string of cars four deep from the aerodrome to the Welsh Harp, and most of these which got as far as Colindale Avenue stopped there while their occupants came in on foot. Some people walked from the Welsh Harp to save time. Thousands tramped in from Golder's Green. And some brave fellows actually walked back the whole way to Town, finding it impossible to get a 'bus or Tube or tram. Yes! We had better use the Croydon aerodrome next time.

The Absentees.

The only absentees from the programme as printed were the airships R.34 and N.S.7. The former was actually, one believes, in dock, but it was intended that R.33 should come over instead.

In the event neither arrived. Their absence was probably due to sundry electrical storms in the South of England, which made it unduly risky to bring the ships far from home. One does not believe that their crews were afraid that the ships would be mistaken for the condemned kite-balloon and so stayed away for fear of being shot down in flames by Mr. Hazell.



The Great Dummy Hoax.

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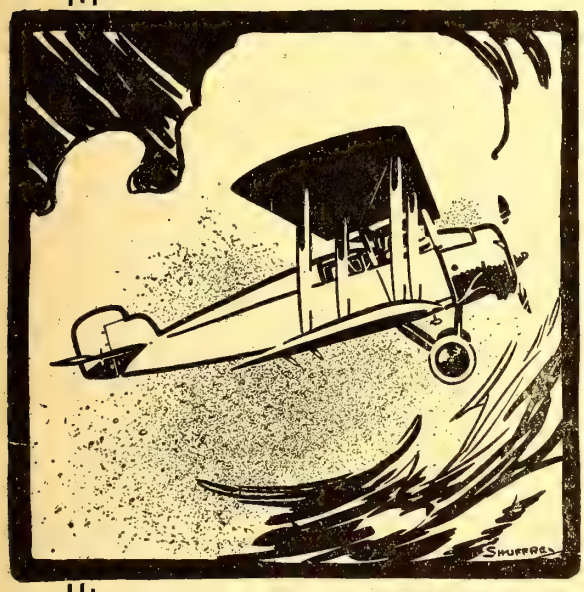

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Outside Help.

Apart from the official events a number of "trade" machines took up passengers for the benefit of the Fund. There was G-EATX, an O/400 Handley Page; there was G-EAPY, Mr. Cotton's big de Havilland, with the Napier engine, on which he crashed in Italy on his way to the Cape, through being told to land on a non-existent aerodrome; there was G-EAPI, a very smart Martinsyde two-seater, beautifully piloted by Mr. Raynham; there was a Vickers-Vimy, painted aluminium, looking just like an Easter egg with wings, and bearing the letters 17X, which do not fit in with any identification scheme, and seemed to stamp her as one of the Chinese batch; and there was a comic Sopwith "Grasshopper," with an Anzani engine, without any number, and piloted most skilfully by Mr. Jordan.

As the two last-mentioned were taking passengers for the R.A.F. Fund, presumably they will not be prosecuted for not carrying correct numbers. Incidentally it was a pity Mr. Jordan and Mr. Raynham had not each a small single-seater on which they could have put up exhibition flights against the others who did so. Their outstanding skill as pilots was lost as mere passenger chauffeurs.

Comic Relief.

Last and not least was the "Heath-Robinson" Avro, carrying apparently eight passengers, sitting in a string all along the fuselage right down to the tail. It had a wonderful system of cranks and levers on the left, working a huge pressure pump, which (apparently) resulted in clouds of smoke pouring out of a funnel just behind the centre section. And on the right it had a colossal brake-lever, which did wonderful things.

Fabric hung from it in shreds. Its struts consisted of a series of series of right-angled dog-legs. It was painted all colours, except for a black patch amidships, on which it advertised that passengers were "carried for a pint." It flew like a rabbit and it landed like a dear little bird, hop-hop-hop-hop. Somebody suggested that the Department of Civil Aviation should charge it the statutory 5s. landing fee for each hop. Each twelfth landing was usually the best.

And when the show was all over it suddenly arose and flew as any self-respecting Avro should. Altogether it was a very joyous affair, and the pilot and passenger, two of the hardest-working aviators of the day, well earned all the laughs they got.

Encore.

Taking it all in all the R.A.F. Tournament was well ahead of expectations. It was so good, in fact, that it suggested all kinds of ways in which it can be made still better next year. Not that the flying can be any better, but rather that there can be more of it, on a bigger scale, and there might be some displays by the ground personnel of the Air Force, such as squadron transport on the move, and so forth, so that the British taxpayer may be more and more convinced that he is getting value for his money from the R.A.F., if nowhere else.

Everybody was delighted that there were no accidents, and one can understand how relieved the Chief of the Air Staff must be that this first great venture by the young peace-time R.A.F. went off without a hitch. Again one congratulates all concerned in the organisation and performance, from Sir John Salmond, the Chairman of the Committee, to the juniorest air mechanic on their success. It was a great day, and one hopes to see many another as great or greater.—C. G. G.

IMPRESSIONS OF THE "PAGEANT.

An official of the Grahame-White Co., Ltd., told one recently that the reason that aviation meetings were not now held at Hendon was because aviation did not really attract the public. When forced to abandon the Ford which conveyed one when still more than a mile distant, owing to the solid mass of cars, one felt very glad that aviation did not really attract the public. One felt still gladder that the public were not attracted when one was separated from the kind friend who owned the Ford, and one hopes he will accept thanks now as one was unable to tender them personally at the Pageant. As it was we were merely separated. If the public had been attracted we might have been killed in the crush.

The weather, on the whole, was kind There was just sufficent rain to justify the bringing of a "waterproof stick," and one was glad to see one of the many who cast ribald remarks at this weapon get thoroughly soaked.

The best performance in the whole show, one thought, was the formation work of the Bristol Fighters. One remembers how good one imagined oneself to be when keeping formation in an F.E.2b, if one kept roughly within 50 yards of one's station. The Bristol Fighters apparently kept station to a foot or so.

The next best turns were the upside-down flying on the Camel and the rudder work of the S.E.5b. Mr. Hawker seemed to have trouble with his engine. An innocent asked whether the reason of his having no bottom plane was to avoid having it damaged if he should desire to repeat his performance of going through railings.

Next time there is a Royal Air Force Pageant, one is going to dog the footsteps of the *Weekly Despatch* man, who evidently found the right tent; he saw, among other things, "200 aeroplanes, 26 balloons, and two airships," besides a "Snippe."

The majority of pilots went far enough back before taking off to ensure a fair height being attained before passing over the crowds; an exception was the pilot of a civil, or perhaps one might say an uncivil, Handley Page, who showed lack of judgment in this respect. One does not know who was the pilot, but it seems up to Handley Page, Ltd., to breathe a friendly word into his ear. One hoped to see the new Handley Page machine during the afternoon, but it had not arrived by 18.00, so one did not W8 any longer.

The pilot of the Vickers-Vimy was particularly clever. He took off a long way back in the aerodrome and passed over the crowd some hundreds of feet up, thus giving an excellent impression of the machine's climbing ability.

The Chief of the Air Staff once more showed his great gift for organisation. The police were quite powerless after the show to cope with the tangle of cars at the exit and an apparently hopeless block ensued. Sir Hugh Trenchard thereupon assumed the role of policeman on point duty, issued a few terse directions, and traffic forthwith moved on in a swift and businesslike manner.

Good side shows were provided by the hosing of an unruly mob who endeavoured to use the Bessonneaux demountable hangars as a grandstand, and by the "Heath Robinson" Avro with its row of heads down the fuselage, owing to which latter fact this machine was occasionally confused with the D.H.14.

There is quite a lot to be said, by way of excuse, for the person who mistook a four-engined Handley Page for the aerodrome hotel, and was quite hurt when the pilot refused to serve him with tea in the lounge.

The N.S.7 and the R.34, probably afraid of being mistaken for the condemned kite balloon, did not put in an appearance. The *Weekly Dispatch* man in describing the death of the balloon, says: ". . . . . flames burst from the dirigible." Can it be that this was the N.S.7 or the R.34 after all?. Perhaps A.F. de M. will explain.

The proceedings were marred by the tragic death of Major Sandbags, who, during the war so often gave his life in parachute tests and who probably has done more flying time in kite balloons overseas than anyone else. When the balloon was falling in flames, Major Sandbags was seen to be caught in the rigging and fell to the ground with a thud. Such was the callousness of the crowd, however, that very little sympathy was extended to the gallant major, who will doubtless go through the same performance next year.

When one saw the "Avro Comique" actually take the air one decided to acquire a new habit (as someone said) and went home.—G. D.

SOME NEW DECORATIONS.

The *Star*, in stating that Miss Sylvia Boyden would jump from an aeroplane with a "Guardian Angel" parachute at the R.A.F. Pageant, said that her fiancé, who had been awarded the R.F.C. and two bars and the R.A.C., for gallantry, would be present to watch her.

To be awarded the Royal Flying Corps and two bars (one presumably is the Trocadero long bar) is a very high honour, but to have the Royal Automobile Club thrust into one's hands (which, one presumes, carries with it its own bar) is indeed the last word, and was possibly granted in pursuance of the patriotic policy—"Homes fit for Heroes to live in."—L. B.

A NOTE TO THE AIRCRAFT INDUSTRY.

Colonel Don Luis Jorge Garcia, the representative in Great Britain of Argentine Aviation, will be glad to receive from all firms concerned with the Aircraft Industry in this country copies of their catalogues and information concerning their prices.

Colonel Garcia is particularly interested in the prices of machinery, material, tools, factory-equipment and all such other things as are necessary for establishing a complete Aircraft Factory in the Argentine Republic.

All documents and information of this nature should be addressed to Colonel Garcia, at Room 45, Hotel Regina, 17, Southwell Gardens, London, S.W.7.

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SIX MONTHS OF CIVIL AVIATION.

In former days, when placidity was commonly to be found in the proletariat, public departments showed no desire to advertise their efficiency or blazon abroad their defects. Each successive year formidable documents, sold with odd official cynicism by weight instead of by inherent value, appeared to delight "the nation of shopkeepers" with masses of tidy accounts showing all that was spent or lost in the country's service throughout the previous year. Everybody was happy, the departments because they had closed another period of expenditure, the Member of Parliament because he had visible proof that somebody had been spending the country's money, and the man in the street because he could think in millions until the next day's *Daily Mail* appeared with its feuilleton of passion or its "Progress of a Cinema Queen." It was a seemly world.

To-day the creation of new Ministries has become the chief industry of the country. Each has duties previously left piously alone or has annexed from one of the great working departments parts of their more creditable operations. Once created they must retain the affection of the public or exist in the fires of its bitter hatred. Either will ensure continued existence, the middle course of good work quietly done alone will make extinction certain. Hence annually or bi-annually the newer departments issue in the form of White Papers tales of the triumphs of the past months, the record of the growing days. Detail where detail attracts but does not inform, and generalisation where vital truths must hide in obscurity, provide a veil through which public curiosity cannot penetrate, even on those occasions when it can be deflected from Slough, poison, dead babies in portmanteaux, and Mary Pickford. "Propaganda" is joining in "blessedness" the words "Mesopotamia" and "co-ordination."

Other Types of Ministries.

There are, however, Ministries whose very duty to the work for which they were formed is to keep the public informed as to their operations. The Air Ministry, created in warlike times with a warlike object, has to-day in its care the whole existence of British civil aviation. It cannot for obvious reasons support the new industry—the new profession—but it can guide the first steps of the infant and supply that encouragement and official assistance which is an essential to the success of aviation. Aviation not only concerns the individual and the corporation, it is an international affair in which each nation has its right to regulate and define. Hence government must take a vital part in its furtherance.

A Half-yearly Report.

On July 1st the Air Ministry published a "Half-Yearly Report on the Progress of Civil Aviation (October 1st, 1919-March 31st, 1920)"—the first in such a form. The original half-yearly report (up to Oct. 31st, 1919) was issued in two parts—a "Synopsis of Progress of Work in the Department of Civil Aviation" and a "Synopsis of the Progress of Civil Aviation in Foreign Countries." These two subjects are now combined in one report.

Part 1 is devoted to "General and British Empire." Foreign relations are summarised. The International Air Convention has now been signed by all the Allied and Associated Powers (the U.S.A. on May 31st last, with certain reservations).

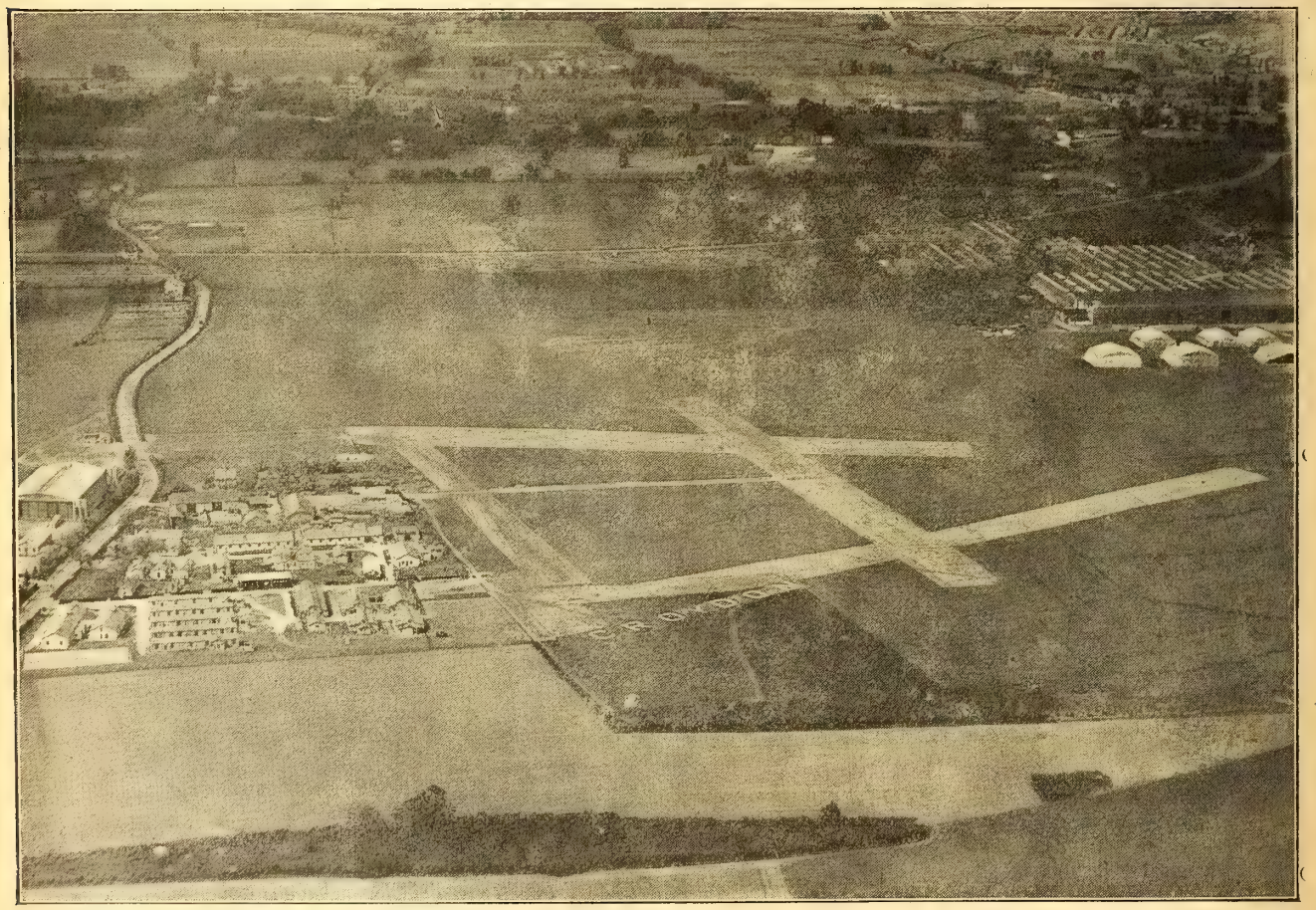
The Air Navigation Bill now before Parliament is described. It has been drafted to bring British air regulations into line with those defined in the International Convention and at the same time to modify defective clauses in the existing regulations.

Under its terms the number of prohibited areas has been reduced, and partial prohibition—a restriction of height of flight over such areas—has been substituted in many cases for complete prohibition.

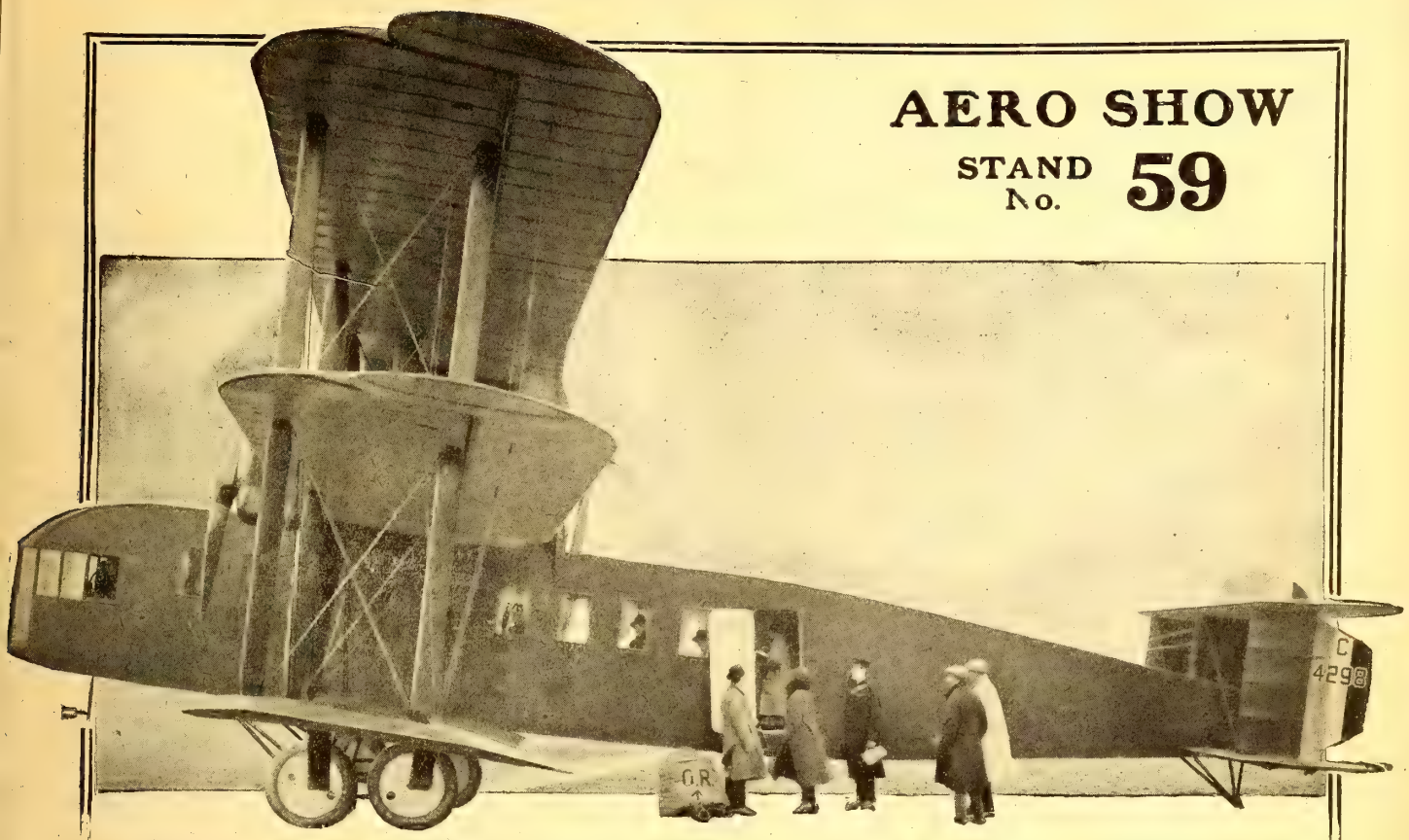
All aircraft, commercial or private, save military machines on duty [though mention of these is omitted] must now obtain Customs clearance before leaving this country.

Goods may now be dropped by parachute under stated conditions.

Aerial lighthouses and pilots' log books both receive attention, though why they should be referred to in the same sentence remains unrevealed.



The London Terminal Aerodrome photographed by Mr. Joseph Edge from a Central Aircraft Company aeroplane. The white intersecting lines are paths cut in the long grass before the whole of the aerodrome had been mown. The white building in the corner of the aerodrome below the "R" of "Croydon" is the lighthouse. The buildings on the left are the C.A.T.O. offices, Customs offices, hotel, I.A.L. offices, etc. One of the sheds with the level crossing over the road can be seen. The buildings in the right top corner are those at present occupied by the Aircraft Disposal Company, in which it is ultimately intended to establish all the offices of the L.T.A. The road and railway leading to Croydon can be seen running along the top of the aerodrome.



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All save experimental aircraft must now possess certificates of airworthiness.

A Sub-committee of the Advisory Committee for Aeronautics have made recommendations as to the load factors to be used in the design of civil aircraft, and "agreement" has been reached on the tests to be undergone by engines for use in civil aircraft. This Report on Load Factors and the Schedule of Engine Tests should, it is thought, prove useful in the obtaining of international agreement in these matters.

In medical matters the procedure as to attendance in the case of medical examination of pilots is being simplified. Special tests to estimate flying stress and air fatigue are yielding satisfactory information.

Ground Organisation.—The State is providing key aerodromes and a wireless system for the distribution of meteorological and other information, and is assisting navigation in many ways.

At Croydon and Lympne the two Government aerodromes for civil aviation there are civilian staffs under the orders of the Controller-General of Civil Aviation. These staffs are formed as follows :—

Croydon : 2 Civil Aviation Transport Officers, 1 cashier, other personnel (wireless and meteorology included), 49.

Lympne : 1 Civil Aviation Transport Officer, 1 Stores Officer, 1 cashier, other personnel (wireless and meteorology included), 27.

Landing grounds in Great Britain to the number of 114 have been inspected and found suitable.

One private aerodrome—Cricklewood—has a permanent Customs official attached for duty. This arrangement will become necessary in the future at other private aerodromes.

COMMERCIAL SEAPLANE STATIONS.

At Felixstowe the Civil Aviation Department is taking over from the R.A.F one slipway, office accommodation, and a number of sheds and mooring buoys in order to accommodate oversea aerial traffic.

As aerodromes are often so far from towns they serve, arrangements are being made where suitable rivers are available for seaplane alighting areas. A scheme has been drawn up for the utilisation by seaplanes of certain stretches of the Thames in the London area, and is being discussed by the authorities concerned.

In regard to navigation, arrangements are being made for the marking of town names on important aerial routes. In regard to night flying, which is essential if civil aviation is to derive full benefit from the superior speed of aircraft, experiments have been carried out at Andover on aerial lighthouses, flares and landing lights. Meanwhile an aerial lighthouse has been installed at Croydon aerodrome, which is also being equipped with night landing gear.

Many text books, maps and charts have been prepared, one of these, an "Aerodrome Book," forming a guide to all aerodromes and landing grounds in the British Isles.

Information has been collected to aid intending aerial travellers on the following routes :—England-India, England-Cape Town, Holland-Java, etc.

WIRELESS EQUIPMENT.

In regard to wireless, vitally important in aerial navigation, the Air Ministry station has been improved. A network of wireless for the assistance of meteorology and aviation is being organised throughout the kingdom. In connection with this scheme W/T stations are being erected on the civil aerodromes at Croydon, Castle Bromwich, Didsbury and Renfrew. There is improvement on routes between this country, France and Belgium.

As to radio telephony, five stations exist in England, and arrangements are being made with France for stations in connection with the London-Paris air route.

Wireless direction-finding equipment has been installed at Croydon and is being erected in Paris and Brussels.

An endeavour is being made to formulate a British draft "International Radio Convention," under which, among other things, a definite world-wide scheme of wave lengths is proposed.

The surplus R.A.F. war wireless or land line equipment is being restored to public use.

Imperial Air Routes.—The financial responsibility for the reconnaissance of the Cairo-Capetown route has been borne by the Department of Civil Aviation. Arrangements are being made for the maintenance of the route by the various Colonial Governments.

"On the Cairo-Karachi route the wireless and land line systems have been improved. Cairo and Bushire have been connected by W/T with intermediate stations at Ramleh, Baghdad and Basrah," and the equipment in a similar manner of Karachi, Bandar Abbas and Chahbar is being undertaken.

An aerodrome site has been selected at Malta. This place will ultimately form a link between England and Egypt.

Meteorology.—The absorption of the Meteorological Office by the Air Ministry and its recent progress are described in detail.

(To be concluded.)

THE OPENING OF THE OLYMPIA AERO SHOW.

It is announced that the Marquess of Londonderry, Under Secretary of State for Air, will open the Aero Exhibition at Olympia on July 9th.

RECIPROCITY.

The Curtiss Aeroplane and Motor Corporation, which represents three-fourths of the entire American aircraft industry, have announced that, as the result of the failure of Congress to protect the aeroplane market against the invasion of British aircraft, their factories will close down as far as aircraft manufacture is concerned and that they will turn their attention to the construction of more useful (from the point of view of remuneration) commodities of life.

Of the many reasons given for this policy, none strikes one as businesslike or possessing particular intelligence or foresight.

In a long authorised statement by the vice-president of the Corporation and Chairman of the Finance Committee it is stated that a Syndicate which has bought the entire stock of aircraft and accessories from the British Government has the intention of exporting that stock to the States and dumping them there. Again, in a subsequent paragraph, it is said that it is not believed that many of these dumped machines will be sold in the United States or that any profit worth while will be made in handling them. Then why, in the name of all that is good, should the Curtiss Corporation worry about them?

Are not all the British manufacturers up against the same Syndicate, who are selling war-worn specimens of their own aircraft? Nevertheless, there are still some British firms who are remaining in the market, as can be seen in a recent leader in this paper; and not a few of these firms are doing well, being supplied with orders from both British and foreign Governments.

It seems, from this "Fox and Grape" policy, that an American will not deal in less than millions, and that unless he can get a monopoly of the whole market in any particular industry he will not do anything at all.

The Curtiss Co.'s claims that they developed the aeroplane that became the standard training machine of the British forces, and also the large twin-motored flying-boats that patrolled the English Channel during the submarine campaign, are merely boasts that they hope will be added to their epitaph by some of the more pungent American news-sheets in their harmless tirade on the misdeeds of the Aircraft Disposal Co., Ltd.

If a firm of the standing of the Curtiss Co. has not sufficient backbone to endeavour to retain the excellent reputation they have already gained with their aircraft, then they can hardly be considered worth their place in the list of the world's aircraft constructors. It seems merely a matter of lack of initiative, and that unless they can sit in their deep-cushioned armchairs and make their customers sit up on their hind-legs and beg, they will cast the aeroplane business to the four winds and set up a chewing-gum business

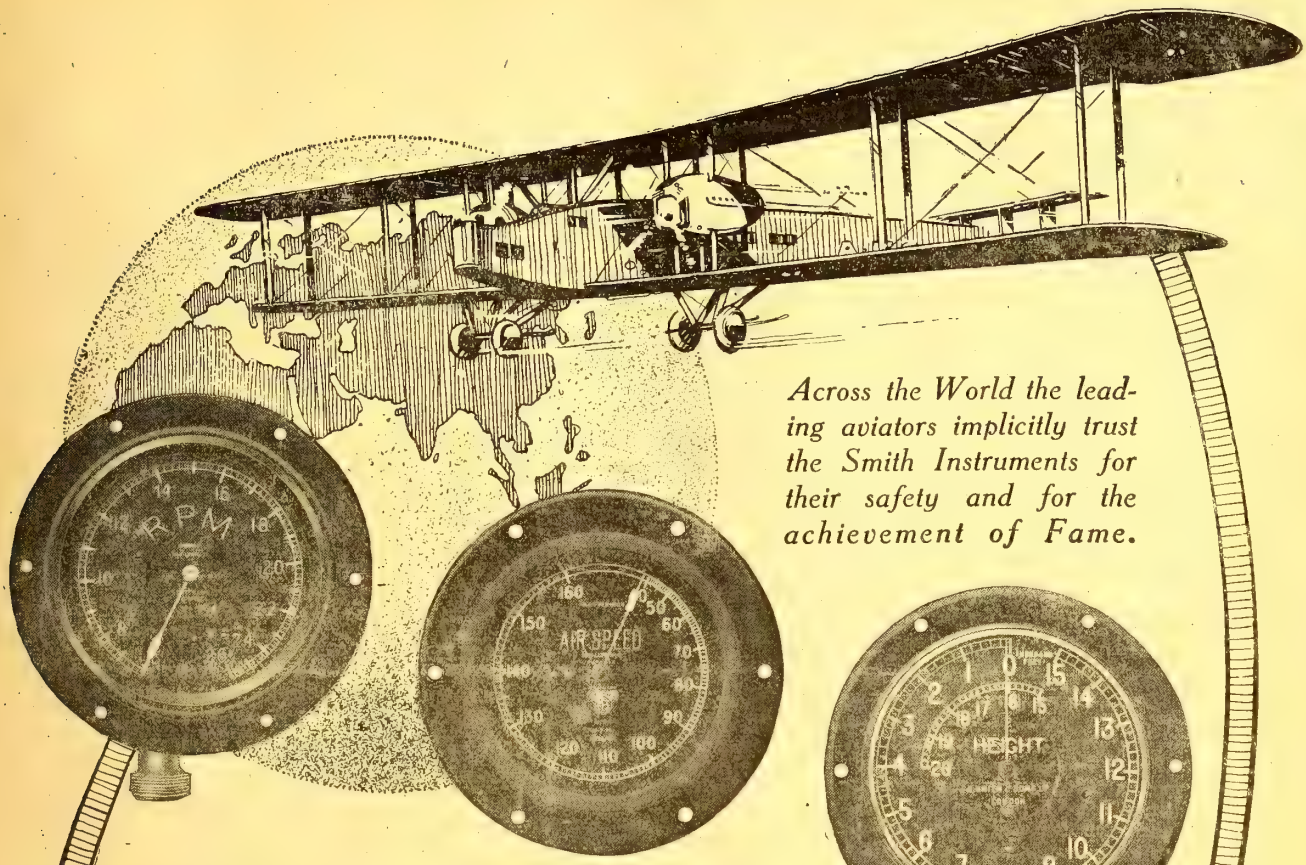
The assumption is that what the Curtiss Co. fears most is that the few British machines that are sold in the States will establish such a reputation for themselves; as some have already done, that in a few years the American manufacturer will not be able to compete with the British manufacturer from the point of view of design and workmanship.

The plant of the Curtiss Co. at Garden City, N.Y., will continue to operate in supplying spares and replacements for the large number of Curtiss machines at present in use in various parts of the American continent.

Personally one cannot see that the American aircraft industry has any reason to squeal. When one remembers the hundreds of millions of dollars' worth of boots, bicycles, automobiles, typewriters, clocks, and such-like junk that the States have dumped onto us, thanks to our Free Trade policy, it seems merely fair reciprocity that we should do a little dumping in return.—L. B.

THE TOUR OF MAJOR GRAN.

Major Trygve Gran and Lieut. Carter left Christiania on June 28th and arrived at Stockholm early the following morning after a flight of 3 hours and 25 minutes. The distance is some three hundred and fifty miles over rough country. On July 2nd Major Gran and Mr. Carter left Stockholm for Christiania, but were forced to land at Oereboro, in Sweden. The machine caught fire on landing and was destroyed. Mr. Carter was severely injured, but Major Gran was unhurt.



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AN OFFICIAL VIEW OF GERMAN AVIATION.

The following statement is extracted from a "Report on Industrial and Commercial Conditions in Germany at the close of the year 1919," issued by the Overseas Department of the Board of Trade in which it is Section 6 :—

AVIATION.

1. The German Government and German industry have realised that commercial aviation is in too early a stage to be nationalised and they have decided to leave its development to private enterprise, possibly aided by Government subsidies. The general view seems to be that aviation can only be made to pay in course of time if it is run on absolutely international lines, and for this reason the Government will probably take over aerodromes in suitable localities and go to considerable trouble and expense in providing them with up-to-date equipment so as to attract trans-Continental aerial traffic. Germany favours the plan of the erection of a large aviation station and harbour on the Zuider See as a junction for North European aerial traffic, in the construction of which it hopes its specialised industries will be able to participate.

2. Since Oct. 1st, 1919, a special Department has been formed in the Ministry of Transport (Reichverkehrsministerium) for dealing with questions of aviation and motoring (Reichsamt für Luft- und Kraftfahrwesen). This Department will have the duty of organising the official automobile and aviation services and drawing up the rules and regulations for civilian motoring and flying.

3. An attempt is being made to consolidate German commercial aviation and to assure the adoption of a uniform policy by the creation of a "Union of Aerodromes and Aerial Transport Concerns." The movement was originated by Major von Tschudi, who took a prominent part in aviation staff work during the war, and aims at uniting in one body towns and concerns which own aerodromes, aerial transport companies and aircraft constructors. The statutes are being worked out by a committee chosen at the inaugural meeting.

4. The actual flying done since the Armistice has naturally been small as fuel could only be obtained with the greatest difficulty; apart from a few lines for aerial post which attempted to maintain a regular service, flights were only undertaken to order.

The most consistent performance was put up by the small airship "Bodensee," built on the Zeppelin principle and owned by the "Deutsche Luftreederei," which is the aviation department of the Hamburg-Amerika line. The airship carried out just over 100 flights between Aug. 25th and Dec. 2nd, nearly all on the route Berlin-Friedrichshafen. During this period it covered 50,000 km. and carried 2,322 passengers and 28,845 kg. of luggage. It is being reconstructed and enlarged during December and January and is to commence flying again in February, 1920.

The same company also maintained an aerial postal service during the first half of the year, but it had to be abandoned on Aug. 1st owing to the impossibility of procuring petrol. The service began on Feb. 5th, 1919, on the line Berlin-Weimar, and was gradually extended to Leipzig, Hamburg, Brunswick, Hanover, Gelsenkirchen, Warnemunde, Swinemunde and Westerland on the island of Sylt. During the six months 1,430 out of 1,532 flights (93.3 per cent.) were accomplished successfully, 4.7 per cent. had to be interrupted for technical or meteorological reasons, and only 2 per cent. had to abandoned owing to the weather; 556,155 km. were flown; 1,574 passengers were carried, and 57,081 kg. of newspapers, 20,963 kg. of letters, and 5,098 kg. of parcels transported.

During the partial stoppage of railway traffic in November a temporary revival of the service took place on the lines Berlin-Leipzig and Berlin-Breslau; the Rumpler Works also employed thirty machines in passenger traffic during this period, chiefly on the lines Berlin-Leipzig and Berlin-Augsburg-Munich.

Aerial services were also planned between Munich-Nuremburg-Leipzig, Munich-Wurzburg-Frankfort-on-Main, and Munich-Vienna (by the Bavarian Air Lloyd) and Berlin-Copenhagen and Berlin-Dresden-Prague (by a Saxon Company), but if they ever materialised at all it was only for a short time. In January, 1920, the aerial post was resumed on a limited scale and the Deutsche Luftreederei is running a service of hydroplanes from Sassnitz to Warnemunde as a link in the journey between Hamburg and Sweden.

5. Aircraft construction has of necessity been confined to a minimum, partly on account of the shortage of all necessary materials, partly owing to the general impoverished state of the country, and partly to the uncertainty as to the interpretation of the terms of the Peace Treaty. Little has been done beyond the building of new types for experimental purposes and of a second Zeppelin like the "Bodensee."

In September the Automobil u. Aviatik A.G. at Leipzig had completed a large machine with a span of 43.5 m., length of 22.5 m., and a height of 6.5 m. It has four Benz motors, two of 250 h.p. and two of 500 h.p., and can carry 18 passengers with luggage in addition to a crew of 6, and fuel for 8—10 hours, at an average speed of 125 km. per hour.

The Junkers Company in Dessau have brought out an interesting type of monoplane made almost exclusively of metal and without any wiring or struts. It has a radius of three to six hours, with six and four passengers respectively, at an average speed of 170 km. per hour. The span is 14.82 m., length 9.50 m., height 3.1 m. The motor is a 160 h.p. Mercédès.

The Fokker Works have produced a somewhat similar type, and Siemens-Schuckert have designed a commercial aeroplane for which much the same details are given. Benz are said to have worked out the plans for a very large and powerful machine with an exceptionally wide radius of action.

It is to be expected that the Germans will come forward with a series of new and varied designs when they are in a position to resume aircraft construction to any extent.

THE "PIONEERS OF AVIATION" DINNER.

H.R.H. the Duke of York, K.G., has signified his intention of being present at the dinner which is being given to the "Pioneers of Aviation" by our contemporary, *Aeronautics*, at the Connaught Rooms on July 12th next.

A PROTEST.

It is stated that the Royal Aero Club has received a protest from the Aero Club de France in regard to the landing of a British aeroplane on the race course at Longchamps shortly before the Grand Prix was run.

A MATTER OF FACT.

Mr. D. J. Mooney, of the Steel Wing Company, is of the opinion that a wrong impression might be conveyed by the paragraph concerning his firm which appeared in the leading article of The Aeroplane last week, and writes as follows :—

> Sir,—My attention has been called to a paragraph on page 1246 of issue dated June 30th, 1920, regarding the Steel Wing Company, of which I am chairman.
>
> I would like to say that I have no complaint to make against the Technical Department as a whole, and to add that up to a certain date—viz., the beginning of 1918—both my firm and myself received very considerable encouragement and assistance from certain distinguished officers connected with that Department.
>
> (Signed) D. J. Mooney.

Personally, one is quite well aware of these facts, and one submits that nothing in the paragraph in question is at all at variance with Mr. Mooney's statement. One merely indicated that the Steel Wing Company, in common with certain other people who were working on steel construction, were obstructed by people in the Technical Department. Not only was such obstruction outside the knowledge of the distinguished officers who were from time to time in charge of the Technical Department, but it was distinctly contrary to the spirit in which they endeavoured to conduct the Department. At almost every period of the war the chief of the Technical Department has been an excellent man, but, owing to the immense number of subordinates, and the curious class from which they were drawn, there has undoubtedly been a considerable amount of what is vulgarly known as "dirty work" done by subordinate officials. And it is to such subordinate officials that one has referred at numerous times and in numerous articles in The Aeroplane.

AN AVOWAL OF FAITH.

Naylor Bros. (London), Ltd., Slough, write :—"In our laboratories our manufactures are constantly undergoing tests for maintenance of quality, and research work is always in progress to find out how we may obtain the best results from the materials at present available. We are still supplying all kinds of aircraft finishes to order, and are receiving inquiries from numerous Continental and foreign firms, both new and old. We would bring to your notice that we have taken advantage of the cessation of war-time production to remove our works from the somewhat confined space at our disposal at Southall to a 35-acre site at Slough, where we are engaged in developing one of the largest varnish and paint factories in the world. We mention these points to show that we are by no means dead, but that, whilst our production of aircraft finishes has, of course, fallen off considerably, we are selling a larger output than ever of all varieties of other finishes, and can at any time undertake aero work. Aerial photographs of our works in their early stage of development will be on view at the Airco stand at Olympia, and, as a matter of interest, the Air Ministry has recently chosen our site for the official marking of the town of Slough."

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NAVAL & MILITARY AERONAUTICS

[The Personal Notices will be found on page 74.]

FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, July 3rd.

H.R.H. the Prince Henry, attended by Capt. the Hon. James Stuart, was present at the Royal Air Force Aerial Pageant at Hendon Aerodrome in aid of the R.A.F. Memorial Fund.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, June 29th.

R.A.F.—PERMANENT COMMISSIONS.—Flying Officer J. R. M. Simpson (A.) resigns his permanent commn., June 30th.

SHORT SERVICE COMMISSIONS.—Flying Officer B. C. Akehurst (T.) relinquishes his short service commn. on account of ill-health, and is permitted to retain his rank, June 26th.

FLYING BRANCH.—Flight Lt. H. S. Lees-Smith relinquishes grading for pay and allowances as Sqdn. Ldr. on ceasing to be empld. as Sqdn. Ldr., Aug. 27th, 1919.

Flying Officer W. J. Butler, A.F.C., relinquishes acting rank of Flight Lt. on ceasing to be empld. as Flight Lt., April 20th.

Pilot Officer (Q.) to be Observer Officer.—C. D. Ball, M.M., April 22nd.

TECHNICAL BRANCH.—Flying Officer L. R. Peirce is restored to the active list, April 26th.

CHAPLAINS' BRANCH.—The following are granted a short service commission:—Rev. C. W. Hall, May 29th; Rev. G. L. Robinson, D.S.O., June 1st.

AIR MINISTRY, July 2nd.

R.A.F.—PERMANENT COMMISSIONS.—The following officers are granted permanent commns. in the ranks stated, with effect from Aug. 1st, 1919:—

Flight Lts.:—F. H. Williams (T.), W. H. Ellison (T.).

The notification in "Gazette" of Jan. 16th is cancelled, and that in "Gazette" of Oct. 28th, 1919, appointing Flying Officer S. M. Kinkead, D.S.C., D.F.C. (A.), to a permanent commn., stands.

The notification in "Gazette" of Oct. 28th, 1919, appointing Flight Lt. N. B. Fuller, M.B.E. (A.), to a permanent commn., is cancelled.

The initials of Capt. J. E. B. B. MacLean, D.S.C. (S.), are as now described, and not as stated in "Gazette" of Aug. 1st, 1919.

The name of Flight Lt. Joseph Laurence Kevin Pearce, O.B.E. (T.), is as now described, and not as stated in "Gazette" of Oct. 28th, 1919.

Flight Lt. J. A. Glen, D.S.C. (A.), is seconded for duty with Canadian Air Board for three years, July 15th.

SHORT SERVICE COMMISSIONS.—The following officers are granted short service commns. in the ranks stated. Except where otherwise stated they will retain their seny. in the substantive rank last held by them prior to the grant of the short service commn.:—

Flight Lt.—C. Court-Treatt (Ad.), July 2nd.

Flying Officers.—E. Burton (A.), June 30th; H. C. Calvey (A.), June 18th; D. M. Fleming (A.), June 14th; H. A. V. Hill (A.), July 2nd; J. G. Horne (A.), June 5th; J. W. Jones (A.), June 18th; S. D. Macdonald (A.), July 2nd; M. Pennycook (A.), June 15th; S. Smith, D.C.M. (A.), June 7th; R. B. Sutherland, D.F.C. (A.), July 2nd; F. Woolley, D.F.C. (A.), June 15th.

Flying Officer (from Pilot Officer).—F. F. Tattam (A.), with effect from June 26th and with seny. of that date.

Observer Officer (from Pilot Officer).—W. W. Bradford, with effect from June 28th and with seny. of that date.

Flight Lt. F. R. Williams (T.) relinquishes his short service commn. on account of ill-health contracted in the Service, and is granted rank of Sqdn. Ldr., June 17th.

Flight Lt. A. D. Spiers (T.) resigns his short service commn. and is granted the rank of Sqdn. Ldr., June 9th.

The notification in "Gazette," May 18th, appointing Flying Officer F. C. Daniel (A.) to a short service commission is cancelled.

The notification in "Gazette," Jan. 30th, appointing Flying Officer M. H. Tisdall (A. and S.) to a short service commn. is cancelled.

The rank of Flying Officer J. T. A. Lochner (A.) is as now described, and not as stated in "Gazette," May 4th.

The date of appt. to a short service commn. of Flying Officer A. J. Macqueen (A.) is April 26th, not May 4th, as stated in "Gazette" of the latter date.

FLYING BRANCH.—Sqdn. Ldr. F. E. Sandford, A.F.C. (A. and S.), is restd. to the Active List, June 22nd.

Wing Comdr. H. M. Meyler, D.S.O., M.C. (Capt., Bord. R.), having retired from the Army and relinquished his R.A.F. commn., is permitted to retain rank of Lt.-Col.

Pilot Officer E. Dionne is dismissed the Service by sentence of General Court-Martial, May 18th.

NAVAL.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

July 2nd.—Lieut.—A. G. Cunard, to *Furious*, June 30th.
July 3rd.—Surgn. Lt.—A. McCallum, M.B., to *Argus*, July 2nd.
July 5th.—Lieut.—R. H. P. Laugharne, to *Furious*.

MOVEMENTS OF SHIPS.

On July 2nd H.M.S. *Argus* left Invergordon for exercises at Scapa and arrived later.

In Russian Waters.

The Admiralty state that the name of H.M.S. *Pegasus*, aircraft-carrier, should be added to the list of ships present at the evacuation of Novorossisk on March 26th and 27th last.

AIR FORCE.

The Surrender of L71.

On July 1st, the L.71, the largest of Zeppelins, arrived at Pulham from Germany on its surrender to Great Britain under the terms of the Peace Treaty.

On the voyage from Germany the ship was navigated by a German crew of one officer and twenty-one men under Captain Heine, who attained fame during the war as a commander of raiding airships. Three British officers also crossed in the ship.

The L.71 left Alhorn at 1700 o'clock on June 30th, against a 20-mile an hour headwind. No wireless message was sent from Alhorn before the vessel's departure and as parts of the wireless set on L.71 had been stolen while the ship was still in Germany, it was impossible to make any direct communication with Pulham. Captain Heine, who knew early on the voyage of the defective telegraphic apparatus, said that he would continue the journey "wireless or no wireless!"

In consequence the arrival of the ship at Pulham—at 06.00 on July 1st—was entirely unexpected by the personnel at that station, who were still in pyjamas or whatever habit they may affect for the passage of the night. As no sufficient landing party was available the L.71 had to cruise over Norwich and the surrounding district for several hours. From 09.00 until 09.45 o'clock the vessel was over Norwich to the annoyance of the late sleepers, but to the pleasure of those who, survivors of the home front in the late hostilities, could tell their children of that which the Zeppelins did in the great war.

On its return to Pulham about midday a landing party was available and Captain Heine, with customary skill, brought the L.71 to the ground, without assistance, directly in line with the shed, built for R.34, in which it was to be housed. No handling lines were dropped, and when the ship was at ground level the landing party, holding the rails, walked her into the shed.

One cannot refrain from admiration of the skill of the German crew, which, according to those qualified to judge, was of high quality, nor from a feeling of sympathy with a defeated foe compelled by the necessities of war to part with one of their proudest possessions. Let those who wish distribute blame for the original outbreak of war and for the manner in which it was waged, but those who serve and have served their King can at least give the honours of war to officers and men who served with equal loyalty their own War Lord, the Emperor.

The Fires at Cranwell.

Another fire, making the fourth, occurred at Cranwell Aerodrome, Lincs., on July 2nd. The damage is estimated to be about £2,000. A large shed containing several aeroplanes was observed to be on fire at 21.30. The camp fire brigade soon had the outbreak in hand and the majority of the machines were removed to safety.

A court of inquiry was held on the following day, but arrived at no conclusion as to the cause of the fire.

The Invention of Bombing Sights.

The claim by Major H. E. Wimperis, R.A.F., in regard to an invention of bombing sights for aeroplanes was concluded before the Inventions Commission on July 5th. Mr. R. Morris, for the Crown, contended that although the invention was clever and of great assistance to the Air Force, it would be establishing a dangerous precedent if officers who, while engaged in experimental work, happen to make an invention, were granted a special award. The Commission will promulgate their decision in due course.

The Late Colonel Pollock's Will.

Lieut.-Colonel Charles Frederick Pollock, R.A.F., of Vernon House, Bloomsbury Square, W.C., and the Isthmian Club, Piccadilly, W., left property to the value of £32,885 19s. 9d. Col. Pollock died on July 17th, 1919.

The Services Lawn Tennis Tournaments.

The draw was made on July 2 for the Services Lawn Tennis Tournaments, which will be held at Queen's Club this week. On the first four days the Royal Navy, the Army, and the Royal Air Force will play separate competitions, and on the Friday and Saturday there will be Inter-Services matches.

There will be seven events in the separate Service competitions, which have all attracted good entries.

A.G.A.

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Wing Commander the Duke of York has entered for the Royal Air Force Singles, and will be partnered in the Doubles by Wing Commander Greig.

Reunion Dinner, Isle of Grain.

It is regretted that certain officers who were eligible and many others who would have been very welcome were not invited to the first reunion dinner last November. This was due partly to pressure of work and partly to lack of sufficiently accurate lists.

The secretary wishes humbly to apologise to all those who were not asked and requests that they will communicate with him as soon as possible stating an address that will always find them. He also wishes to extend the membership not only to all officers connected with Grain, whether they were actually stationed there or not, but also to those who were connected with the station in a civilian capacity, and hopes that they too will communicate with him. The next dinner will be held during the coming Motor Show, probably in November.

The secretary is L. A. T. Pritchard, Foxhill House, Sutton Coldfield, Warwickshire.

ITALY.

The Italian correspondent of The Aeroplane writes :—

Relief Work.

Various journalists writing from Albania report the activity of Italian aircraft in the deplorable events which are occurring there. In one report Capronis sent to the relief of the outposts were met with urgent signalling for food. On returning with supplies thereof they found it was too late!—T. S. H.

RUSSIA.

Aircraft Construction during the War.

Before the war Russia only possessed four aircraft factories : three in St. Petersburg and one in Moscow. In addition, two factories were engaged in making aero engines. These six factories employed roughly 2,000 men.

In 1915 two new factories came into being, and in 1916 and 1917 two further ones were formed. There were also many small concerns which during the war were engaged in constructing aircraft in small quantities. In 1914, 329 aeroplanes had been constructed; in 1917 this number was raised to 963.

SWEDEN.

The Italian correspondent of The Aeroplane writes :—

A Visit.

The three "Savoia 13" flying-boats which were mentioned in The Aeroplane of June 16th, arrived in Sweden on the 20th, having done the 3,500 km. from Sesto Calende to Stockholm in four stages without incident. The central European route was followed as usual.—T. S. H.

TURKEY.

The Turkish Affair.

It is reported that Kemal Pasha's forces have been supplied with several aeroplanes by the Bolsheviks.

Another account states that these machines have been sent to Kemal Pasha from Germany via Russia. The number is stated to be fifteen, and the pilots to be Germans in Turkish pay.

THE OBJECTS OF THE ROYAL AERONAUTICAL SOCIETY.

The following communication has been received through the Air Ministry, the envelope in which it was enclosed being franked by the Department. Though one appreciates the high position held by the Royal Aeronautical Society and its importance in the furtherance of aeronautics, one cannot but feel that the action of the Air Ministry in distributing the communiqués and advertisements of the Society is distinctly improper and is not in accordance with the principles which have actuated Departmental action for many centuries. If the Royal Aeronautical Society is to receive such favour should not the same courtesy be extended to the Royal Aero Club, which is senior to the R.Ae.S. as a Royal Society, and to the Institute of Aeronautical Engineers, which has important functions to discharge in the sphere of technical aeronautics? It is to be hoped that the Air Ministry will refrain from such methods or if it desires to descend from its official pedestal will at least be impartial.

ROYAL AERONAUTICAL SOCIETY.

(Founded 1866.)

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Council.—

A. E. Berriman. F. H. Bramwell. Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O. (*Chairman elect*). Lieut.-Colonel A. H. Burgoyne, M.P. Wing Commander Cave-Browne-Cave, C.B.E. Sir Mackenzie D. Chalmers, K.C.B., C.S.I. Sir Robert Hadfield, F.R.S. Prof. B. Melvill Jones. Major A. R. Low, D.Sc. A. Ogilvie, C.B.E. Lieut.-Col. M. O'Gorman, C.B. F. Handley Page, C.B.E. A. J. Sutton Pippard. A. V. Roe, O.B.E. Lieut.-Colonel H. T. Tizard, A.F.C. G. Holt Thomas. Brigadier-General J. G. Weir, C.M.G. Major H. E. Wimperis, O.B.E.

Honorary Treasurer : Mr. A. E. Turner. *Secretary* : Lieut.-Colonel W. Lockwood Marsh (late R.A.F.). *Offices* : 7, Albemarle Street, London, W.1.

Aims.—

The Society exists for the furtherance of the Science of Aeronautics, and its activities fall into the following headings :—(1) Protecting the interests of the aeronautical profession by conferring a technical status on those qualified for such distinction. It acts as the professional society or institution of qualified aeronautical engineers. (2) Organising discussions and publishing papers on subjects of importance in connection with the various branches of aeronautical science. (3) Encouraging and assisting technical students who desire to adopt the aeronautical profession for their careers. (4) Providing an organisation wherein those interested in aeronautics from scientific or other motives, but who are not professionally connected with aviation, may meet together, have opportunities of study and keep themselves in touch with aeronautical affairs.

Membership.—

The membership is divided into two categories :—

(*a*) *Technical*—(1) *Students* : Reserved for those under the age of 26 who are receiving a technical training such as will fit them in due course to become Associate Fellows. No entrance fee. *Subscription* : 1 guinea.

(2) *Associate Fellows* : Reserved for those who have attained to an acknowledged position in the science of aeronautics. Entitled to use the letters A.F.Ae.S. after their names. *Entrance fee* : 3 guineas; *Subscription* : 4 guineas.

(3) *Fellows* : Reserved for those who have attained to considerable eminence in the science of aeronautics, or who are likely to be of service to the science of aeronautics by reason of their personal distinction and public eminence. Entitled to use the letters F.Ae.S. after their names. *Entrance fee* : 5 guineas; *Subscription* : 6 guineas.

(*b*) *Non-technical* (open to all).—*Members* : All who desire to support the Society are eligible. *Entrance fee* : 1 guinea, *Subscription* : 4 guineas.

Associate Members : Ditto. No entrance fee; *Subscription* : 2 guineas.

Privileges.—

Members in any of the above grades are entitled to attend the Society's lectures, receive the monthly Journal free of charge and consult books in the Society's library. All grades except Associate Members are entitled to borrow books from the library. Students and Associate Members are not entitled to vote.

Publications.—

The *Aeronautical Journal*, which is published monthly, contains notices of the Society's activities, full reports of all lectures (and discussions thereon), original scientific papers, reviews of aeronautical books, etc.

Original papers of a fundamental character in the science and technology of aeronautics are published from time to time as "Transactions of the Royal Aeronautical Society."

Library.—

The library, which is housed at the Society's offices, 7, Albemarle Street, W.1, contains a valuable collection of exceedingly rare historical books as well as constituting a good reference library of modern aeronautical literature. It is open for the use of all members from 9.30 a.m. to 5 p.m. on weekdays (9.30 a.m. to 12 on Saturday), and on the table are to be found the leading aeronautical and engineering papers of every country in the world.

Lectures.—

During the winter months meetings are held on the first and third Wednesdays in each month at which papers are read, followed by discussions, on a wide range of subjects covering the whole field of aircraft design and operations. They are held at 5.30 p.m. Members are admitted without tickets and may obtain tickets for their friends on application to the Secretary.

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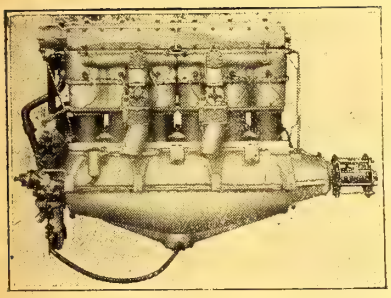

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THE AEROPLANES AND ENGINES AT OLYMPIA.

With the approaching opening of the Aero Show on Friday next, it is becoming more and more possible to estimate the probable value and interest of the exhibits which will there appear.

In the aeroplane and engine sections the number of exhibitors will be relatively small, but it seems certain that the standard of these exhibits will be extremely high.

Machines or engines presenting startling and untried features will not appear, except perhaps in the form of models on those stands, devoted to uses of inventors, and arranged and controlled by the Royal Aero Club.

Novelties there will be, but novelties which emanate from the brains of experienced designers, who have bent their talents to meet the exigencies of the new phase whereon aviation has but just entered, and these, if less sensational than were some of the materialised brain-waves of bygone shows, are yet of a more serious import and more permanent interest, in that they form milestones in the steady progress of the aeroplane to its ultimate position as the rapid transport vehicle of the civilised world.

Some few novel war machines will be present, but the great majority of the aeroplanes are to be of the purely commercial type, and even the converted war type will scarcely be discovered.

Thus the British aeroplane constructor can be congratulated that in an exhibition held so shortly after the war, and in a period of an acute depression in his particular business, he has risen to the occasion and has shown, not samples of what wondrous things he has done in the past, but a really illuminating exposition of what he can offer for the present and a brilliant presage of what he will be be able to do for the future.

In the aero-engine exhibits the position is—not unnaturally—somewhat different.

The building of a new type of engine calls for very great expenditure on plant, special tools, jigs and fixtures, and such an expenditure is difficult to justify unless a reasonably certain market exists for that engine when built. That market does not yet exist, and therefore, though there are to be new engines at Olympia, they are practically entirely designed under the impulse of war.

This perhaps is not so serious a matter as it may seem. Granted that the commerce of aviation calls for engines of different qualities to those demanded by war flying, yet at a pinch the war-time engine will serve the present and the immediate future.

And, as there are other industries than the aircraft one which call for the continuous development of the internal combustion engine, there need be little fear that, when a demand for commercial aeroplane engines in appreciable numbers does arise, there will be those who can and will cope with it.

Nevertheless, this state of affairs will impose yet another hindrance to the peace-time development of air traffic, and one cannot but regret that some of the great British engine-building firms have not taken more of their courage by both hands and invested some of their vast resources in the work of developing the aero-engine which is even now desirable, and which in the near future will be essential.

Such an investment would certainly bring in no return for some few years, but thereafter it should prove more valuable than all the Mesopotamian oilfields put together.

Noticeable features at the Show will be the very wide gap in size and power between certain of the small sporting types which will appear and some of the very large passenger-carriers. The presence of some few amphibians is noteworthy. More important from the purely technical aspect is the growing use of metal for structural purposes.

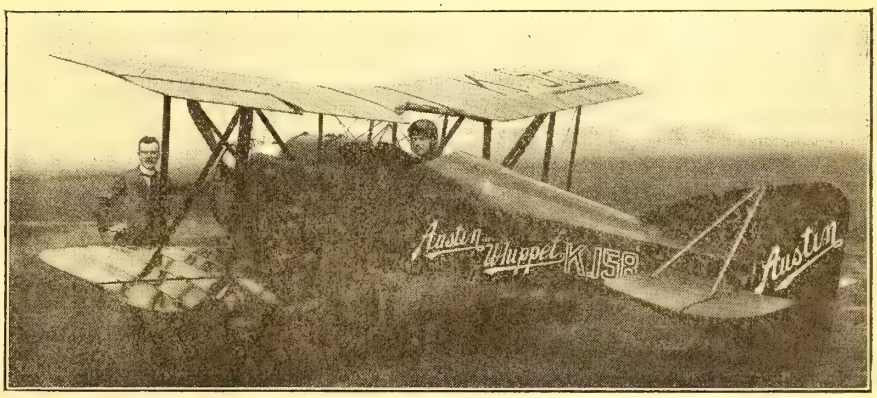
The very extensive use to which aluminium is now put by engine builders will be very obvious.

Hereafter there is to be found, arranged in alphabetical order, an account of all those who are to exhibit aeroplanes or engines at that Show.

THE AUSTIN MOTOR CAR COMPANY, Northfields, Birmingham.

Before the recent disturbance of this happy realm by what has been—perhaps not inaptly—described as a war, the makers of aircraft in this country were few, poor, generally accounted mad, and, upon the whole, happy in a curious way.

During the war these originals were joined in their work by numerous others; they became, temporarily at least, rich, were the object of adulation from many quarters, including Carmelite House, and in consequence extremely unhappy.



THE AUSTIN "WHIPPET."—One of the first of the small sporting type aeroplanes to be designed in Britain. It is here seen at the private aerodrome of the Austin Motor Car Co. at Northfields, Birmingham. As is detailed in the description herewith, the needs of the private owner pilot have been very carefully considered and met in the design of this excellent little machine. Mr. Kenworthy, the designer, and Mr. Nares, the Austin pilot, are seen with the machine.

Of the many who joined the pioneers few now remain. To the most of them it is obvious that riches are of more account than a joyful heart, and, although the heart of the aircraft manufacturers of to-day have not yet returned to their original state of innocent joy, yet there be signs that the burden of great riches is to pass from them for a while, and thus, immune from the fears which wealth begets, they will shortly reassume their older happy state. But there are some few of the later comers who have signified their intention to keep in the lean times of peace the interest in the development of aircraft which came to them in war. Obviously these cannot be impelled by motives of mere greed, and therefore one must assume real interest in a problem worthy to be solved, and holding out hopes of an ultimate development which shall repay for the early and thankless tasks of pioneering.

Therefore the Aviation Department of the Austin Motor Car Co. may be hailed by the elder members of the Industry as a worthy brother committed to the same troublous times as are they.

In the Austin "Whippet" the firm have attacked one of the most difficult, and, according to some authorities, least promising, of the problems of aviation. As these latter pessimists base their conclusions on arguments which indicate that solo motorcycles can never be sold in quantity, one may fairly safely question their conclusions.

Whatever may prove to be the case there is no doubt that in the "Whippet" the designer has considered very carefully all the desirable attributes of the single-seater sporting type machine.

Small size and ease of stowage, combined with an adequate surface to ensure that the machine shall not be too lively for comfort, great strength, robustness of construction, simplicity of assembly and absence of any tendency to require continual readjustment, have all been secured.

The fact that the machine is of practically all-metal construction secures it from any tendency to warp out of truth under the variable climatic conditions which it may have to endure.

A small and reliable engine ensures low fuel costs and low maintenance charges, and yet a performance adequate for meeting all but the very worst of weathers and a manœuvrability which renders "stunting" safe, are all combined.

Those who wish to demonstrate that their love of flying extends to beyond showing off in the company of their best girls might therefore do much worse than consider the "Whippet" as their next season's sporting mount.

WM. BEARDMORE & CO., LTD., Glasgow.

In the days before the war Beardmores built, if one remembers aright, warships mainly, and some aeroplanes. There were many and various incidental activities—for instance, the firm manufactured its own steel, built its own engines, and carried on many branches of engineering, some directly for the benefit of its shipbuilding work and others partly as by-products thereof.

Nowadays—if political reports be not altogether untrustworthy—the building of warships is a dormant industry, but no one has as yet accused Beardmores of somnolence.

On the contrary Beardmores appear to have realised very thoroughly that "transportation is civilisation," and thus to-day Beardmores build, in addition to ships and aeroplanes, locomotives and motor cars, and they are willing to undertake the building of airships.

But the very fact that a great armament firm, such as is this, should, after the war, still continue their aircraft works and should have laid down a design programme of purely commercial machines, is adequate proof of their foresight.

In addition to their exhibit at Olympia they will, during the Show, have a machine at Cricklewood which will give demonstration flights.

Two Beardmores will appear at the Show proper. Of these, the W.B.11 will be of the two-seater sporting and touring type, fitted with a Beardmore 160 h.p. engine. This machine has an excellent all-round performance, the reliability of the engine fitted is a by-word amongst those who fly, and it is therefore eminently suited for its intended purpose or for that of light mail carrying.

The second machine—the W.B.X.—is of those designed for the smaller class in the forthcoming Air Ministry Competition, and has the qualities of safety, economy and comfort, together with a long flight range and a low landing speed. Naturally a Beardmore engine forms the power plant.

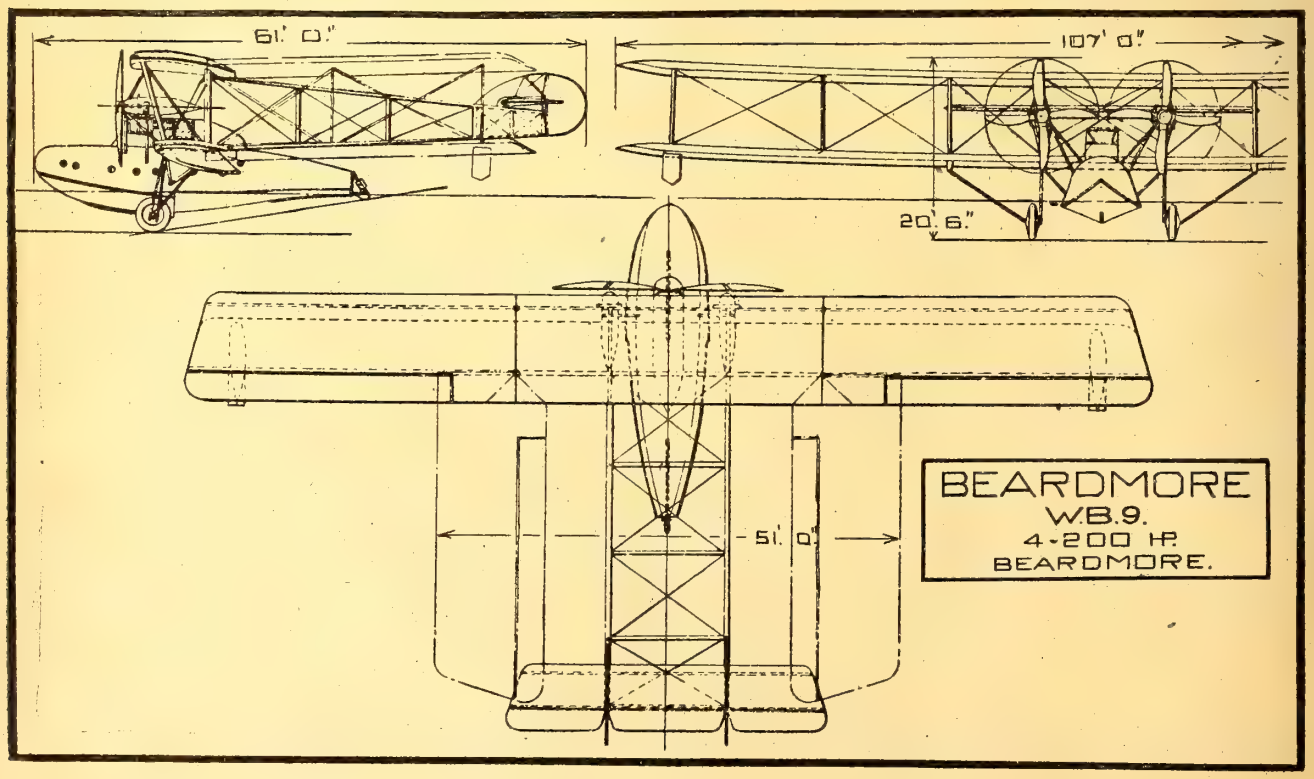
One feature of great interest will be found in the structure of the fuselage. This has been designed in the light of the firm's experience with the construction of rigid airships, and is carried out in duralumin girder work.

As it will appear at Olympia, the wings are constructed in the normal manner, on spruce spars with wooden ribs. At the competition the machine will be fitted with metal wings, but unfortunately it has been impossible to complete these in time for Olympia.

One of the very few airship exhibits will also appear on the Beardmore stand. This is a section of a passenger car for a rigid ship of the R.36 type, which it is hoped to employ for commercial services.

In addition to these two machines there will be on the stand one of the famous Beardmore engines and a number of interesting models, including those of R.34, and H.M. seaplane carrier "Argus"—both products of the firm's workshops.

The large amphibian Bat boat whose general arrangement is reproduced below will not appear at Olympia—but its design is evidence of the firm's enterprise.



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THE BLACKBURN AEROPLANE & MOTOR CO., LTD., Olympia, Leeds.

Pioneer Days.

The Blackburn firm traces its origin back to the spring of 1909, when Mr. R. Blackburn successfully flew his first aeroplane at Saltburn in Yorkshire. During the following five years he developed a series of machines, among which the 80 h.p. Gnome monoplane (1911), the "all steel" monoplane (1911), and the 130 h.p. Salmson seaplane (1913), are the most interesting. The first figured in Captain Hucks' 1,000 mile tour in south-west England, the "Circuit of Britain" race of 1911, and numerous early commercial flights in Yorkshire. The "all metal" monoplane, the first of its type to be built in England, foreshadowed in a remarkable way the present trend of design for military purposes. The seaplane undoubtedly influenced the career of the company during the late war by attracting the favourable attention of the Naval authorities.

The activities outlined above gained for Blackburn aircraft a reputation for the technical skill and practical sense shown in their design and the accuracy and excellence of their workmanship, and led to the formation, early in 1914, of the present company to deal with pre-war Government orders.

1914—1918.

During the war the company served in a dual capacity. As a manufacturer it produced for the War Office, Admiralty and Air Ministry a steadily increasing output of aircraft and accessories. Fighting aeroplanes, scouts, bombers, patrol seaplanes, flying boats, ship aeroplanes and torpedo-carrying aeroplanes were among the products, whilst important minor features were propeller construction and the manufacture of standard fittings and accessories, used widely and known as B.A.P. fittings. In spite of rapid expansion of organisation and dilution of labour, the high standard of workmanship maintained in the early years was rigidly kept up.

As a designing firm the company was engaged on experimental design for the Admiralty, and more especially upon the twin-engined type of seaplane. From these designs developed two widely different series of machines—the twin-engined type, of which the "Kangaroo" is the present specimen, and the torpedo-planes, the development of which was entrusted to the company by the Air Ministry during the latter years of the war.

To deal adequately with experimental seaplane work the firm acquired the air station at Brough, which has since developed into an experimental branch, with workshops adequate to any work short of intensive production, together with excellent flying facilities for both aeroplanes and seaplanes.

Post-war Policy.

Believing firmly in the future of aviation, Blackburns are determined to remain actively in the aircraft industry through the period of post-war deflation and thus to place themselves in readiness for the time when the commercial possibilities of aircraft should be established. But optimism has not blinded the company's eyes to the difficulties which must be faced in the interim. The production departments have been largely diverted to other classes of work, including the inevitable motor car, which has proved so successful as to permit the maintenance of a relatively non-productive aircraft department. This policy was the more easily adopted because the firm is a private company controlled by long-sighted shareholders, and its financial policy throughout the war had been framed with a careful outlook toward these lean years.

A department has been built up to ascertain and to encourage the possible commercial uses of aviation and to serve as the nucleus of a sales organisation. This work has been slightly productive from the commercial standpoint and has had considerable educational value both to the public and to the firm. On the technical side, the policy has been to rise out of the groove of war-time design and tackle the problem of the commercial aeroplane without preconceived views, appreciating that, though war types may be converted to serve as stop-gaps, true commercial design must have its basis in new technical ideals and new research. This policy for commercial design has not involved in any degree the discontinuance of design for Naval and Military purposes.

Recent Achievements.

The firm's achievements during the last year group themselves mainly around the "Kangaroo."

During the last twelve months "Kangaroos" covered 20,000 miles and carried 18,000 lb. of cargo and 1,600 passengers. The "Kangaroo" was awarded a gold medal and prizes at the 1919 Amsterdam exhibition. It competed creditably in the recent flight to Australia, and the opinion of the crew is shown by the following extract from a letter written when engine trouble brought an end to the flight. It reads: "A sixty-mile flight in one hour ten minutes from 3,000 ft. with one sound engine and a 70 per cent. load is a feat you may be proud of," and is evidence of the advantage held in time of emergency by twin-engined aircraft such as the "Kangaroo."

The "Kangaroo" also served to inaugurate a successful cargo-carrying service between England and Holland during the spring of this year, and has been selected by the 1921 Antarctic Expedition for use in Polar survey work.

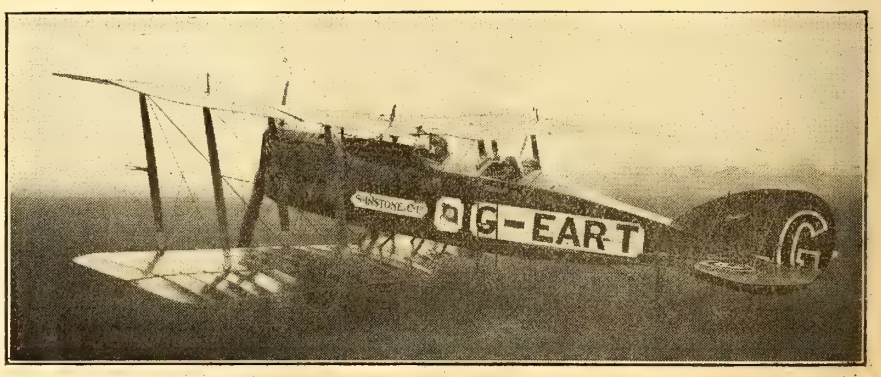
The Present Day.

The company is admirably fitted to meet the revival of the Aviation Industry presaged by the coming Aero Show at Olympia. At Leeds it has a well-organised modern and well-equipped factory, capable of output on a scale comparable with that obtained in war-time, which has been diverted, rather than converted, to the making of motor cars and lorries, and is equally capable of re-diversion to aircraft work. Brough is one of the two permanent civil flying stations of northern England, and an experimental depot staffed by experienced engineers and mechanics, closely in touch with modern developments. Labour troubles are infinitesimal, owing to the democratic spirit of the management. Finally, owing to close co-operation with the North Sea Aerial and General Transport, Ltd., valuable experience has been acquired in commercial flying, which has aided considerably the carrying out of a strong experimental programme.

At Olympia the firm will exhibit one of their latest productions, a torpedo-carrying aeroplane designed for the Air Ministry for service use. Owing to this fact the machine will appear shorn of most of its special equipment, but it will nevertheless be found to show many interesting points of design and construction, though a description of these is not permitted by the authorities till such time as the Exhibition allows one to discover by inspection its salient features.

THE BRISTOL AEROPLANE CO., LTD., Filton, Bristol.

To attempt at this date to introduce to the regular readers of The Aeroplane the famous Bristol firm—once the British and Colonial Aeroplane Co.—would appear to be superfluous. But as on an occasion such as this this journal is likely



The three-seater Bristol "Tourer" which has been for some time in the regular service of the Instone Air Line. This machine is fitted with a Siddeley "Puma" engine (240 h.p.) and has side by side accommodation for two passengers aft the pilot's cockpit. The machine of this type to be exhibited at Olympia will differ to the extent that the passenger cockpit is completely enclosed.

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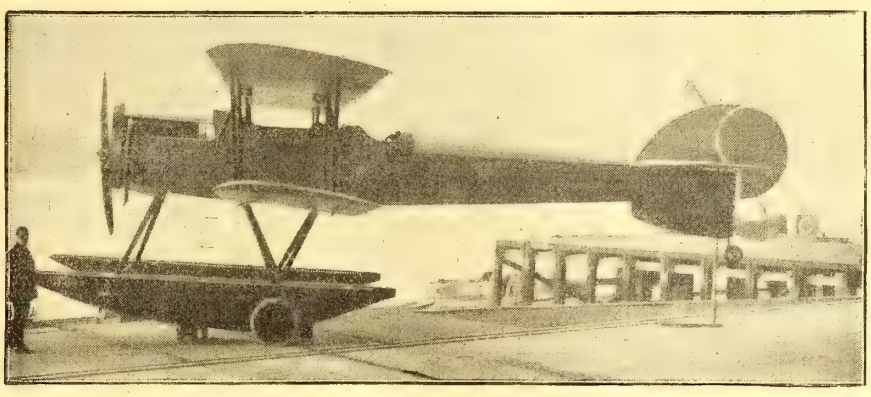

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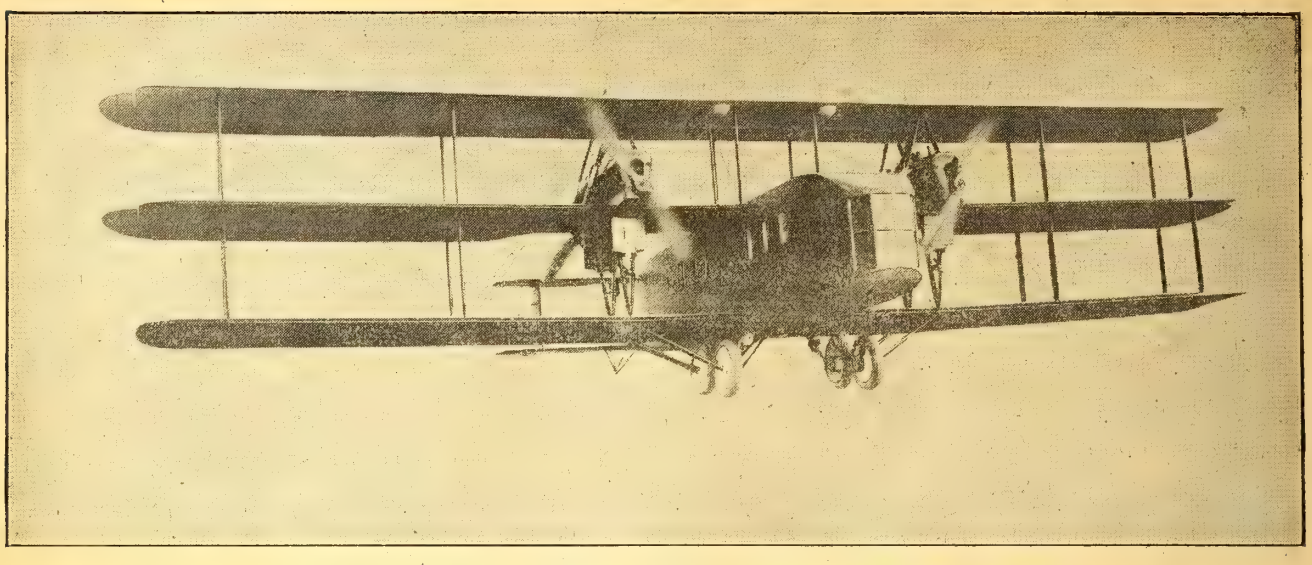


The Bristol "Pulman" Triplane (4-410-h.p. Liberty Engines) in the air.

to fall in numerous other hands it may be well to recall the fact that it was founded in 1909 by the enterprise of the late Sir George White—a pioneer of electric traction in England and so presumably another of those who have held transportation to be civilisation. Since that date the concern has consistently built aeroplanes through thick and thin—and has continuously possessed a reputation for sound design and excellent workmanship.

The Bristol Bullet of 1914 served with great distinction in the earliest days of war. The Bristol Fighter of 1917 did certainly as much as any other single type of aircraft to establish the aerial supremacy of the Allies, and had war continued but a little longer the Braemar triplane bomber would doubtless have been a very potent weapon in our armoury, and the "Badger" equally might have been expected to carry on the work of the ancestral "Fighter" with all success. But in these days of peace new war aircraft are even more *"Taboo"* as a subject for the descriptive pen than they were recently, and the Badger will not appear at Olympia.

Such Bristol machines as will there appear will be of peaceful aspect. The stand will contain at once the largest and the smallest aeroplane in the Show with an intermediate machine of normal dimensions, and the contrast between the great 1,600 h.p. Pulman Triplane, with its 1,900 odd sq. ft. of wing area, and the tiny "Babe," with one-fortieth of the h.p. and of barely 20 ft. span, should add greatly to the interest of their stand.

And the intermediate machine, the three-seater "Coupé Tourer," will be found to be an excellent example of the general utility high performance commercial passenger carrier, eminently suitable for either the early development of a regular high speed passenger and mail service over a route whereon aerial traffic is at a low intensity, for private business use, or for what has been termed "taxi" services.

It may very safely be predicted that all three machines will be distinguished by the very excellent workmanship and sound design which is characteristic of all Bristol aircraft.

THE BRITISH AERIAL TRANSPORT COMPANY.

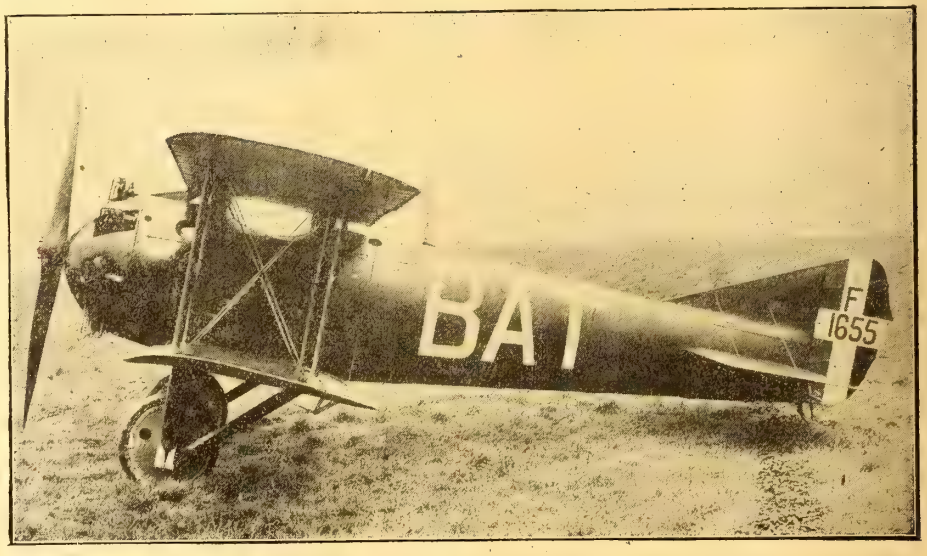
The British Aerial Transport Co. will always have to its credit the production after the war of the first aeroplane designed from beginning to end as a commercial craft.

Founded during the war to meet the country's demand for war machines the firm had at the time of the Armistice produced two of the finest machines of the single-seat fighter class that have yet been seen, and the rapidity with which their four-seater commercial machine was designed, built, and tested should prove a happy augury as to their future.

Unfortunately there were grounds for believing that after this excellent beginning the firm was to retire from the further peace-time development of Aerial Transport, but the fact that they are to exhibit at Olympia may, one hopes, be taken as a sign that this intention has now been renounced. Doubtless continuance in the business of aircraft constructors will involve the exercise of patience under adversity—that lot, however, is common to all those who would pioneer, but if they can but continue as they have started, and if all their products show the originality of design and the foresight which have been so demonstrated by their past efforts, they need not fear but that the future will bring ample reward. But whatsoever may be their future, their exhibit at Olympia will be of the greatest interest.

It is to include the famous B.A.T. "Bantam"—the first of the firm's war machines, and one which in performance, manœuvrability, and excellent fighting qualities, set a new standard for this class of aircraft—and the B.A.T. Commercial Mark 1—the five-seater limousine machine whih has already

THE B.A.T. BANTAM (170-h.p. A.B.C. "Wasp" Engine).—This little machine, designed by Mr. Koolhoven and built by the B.A.T. Co., was first produced in 1917, and earned the admiration of all competent judges on its early trials. It revolutionised existing ideas of what a light single-seater fighter should be capable of doing, but it never reached the war.



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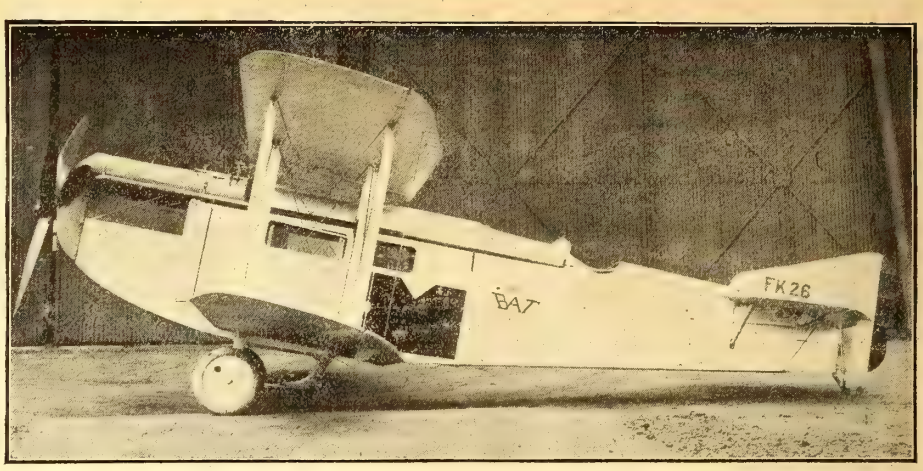
St. James's 2.



THE B.A.T. COMMERCIAL FIVE-SEATER (Rolls-Royce 375-h.p. engine).—This machine, the first machine designed and built in any country expressly for commercial purposes, is another of the products of Mr. Koolhoven's genius. This machine left the ground as it was drawn in the drawing office and required neither modification nor adjustment upon her trials.

been referred to as the first machine designed and built purely for commercial purposes. This machine still maintains its position as one of the finest of its class which has yet been produced, and if the next B.A.T. machine is as great an advance as was this, the firm may rest assured of a great future.

CENTRAL AIRCRAFT CO., 179, High Road, KILBURN, N.W.6.

Though the name of the Central Aircraft Company is new since the outbreak of war, the origins of its interest in aircraft dates back to pre-war days, for the firm is, in fact, an offshoot of the firm of R. Cattle and Sons, who had long manufactured wooden aircraft components. The Central Aircraft Co., under that name, came into being during the war and were busily engaged in ministering to the needs of the Air Forces up to the Armistice.

With the advent of peace they immediately embarked on a programme of civilian aviation. They acquired the ex-R.A.F. aerodrome at Northolt, built and designed school machines, and established at Northolt a flying school which has consistently produced excellently trained pilots. In addition they have taken a vigorous hand in the joy-riding brand of aerial propaganda work.

The school machines which they have turned out—of the "Centaur 4" type—have proved most excellent instructional machines, and their good qualities have led since to the production of the "Centaur 4a," a slightly enlarged edition of the 4, fitted with three seats, and forming an excellent machine for sporting, touring and joy-riding services. The engine—an Anzani of 100 h.p.—is of proved reliability, and it has been fitted by the firm with a starting gear which allows the pilot to start up from his seat. Carrying three hours' fuel, a speed of 78 m.p.h. is attained, with a climb adequate to all commercial purposes, and a ceiling of 17,000 ft.

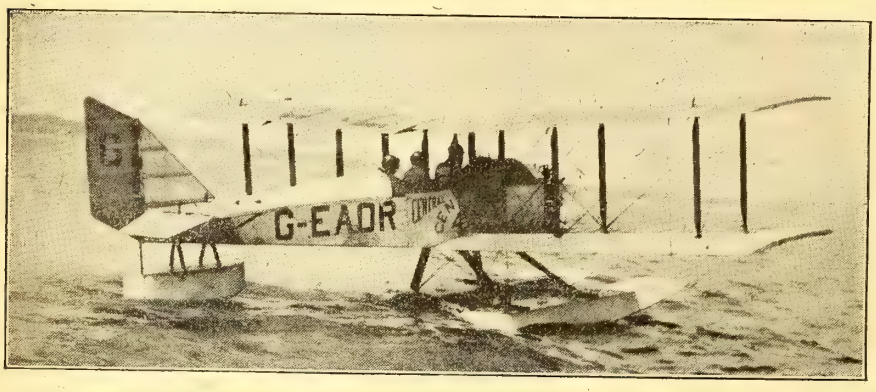
The moderate speed—attained by an engine of relatively low power—naturally leads to great fuel economy, and this is one of the main features of this type.

The "Centaur 2a" machine is perhaps an even better example of the firm's enterprise.

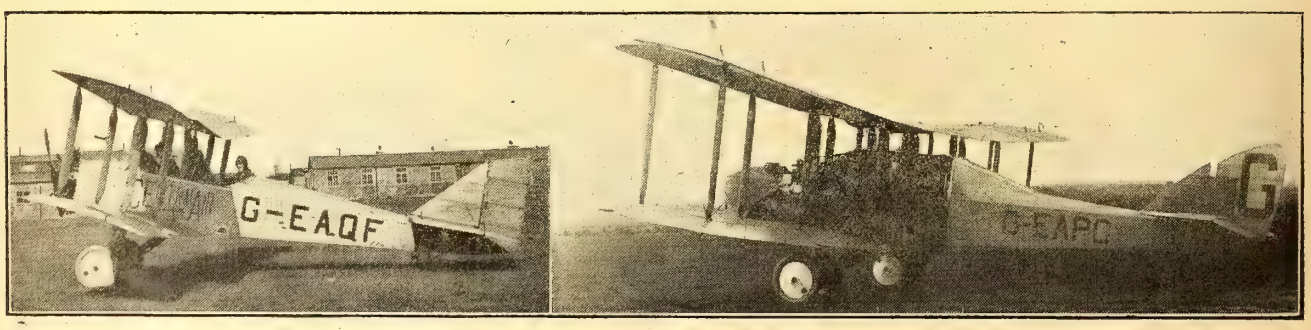
It is a two-engined passenger carrier, not of the giant class, but of a size which, with a single engine, would call for one of the most modern of high-powered engines—nowadays an expensive affair both to purchase and to maintain, and of a class which can scarcely yet be regarded as safely past its infantile disorders.

By using two of the 160-h.p. Beardmore engines a power plant of proved reliability known to call for very low maintenance costs is attained, with a machine of such a size that many of the drawbacks usually associated with twin-engined craft are avoided.

The machine is of the cabin type and is normally fitted to carry six passengers, pilot and mechanic. Folding wings permit the machine to be stowed in a very small space.



THE CENTRAL AIRCRAFT CO.'S CENTAUR 4B SEAPLANE (100-h.p. Anzani).—A machine designed on the basis of the firm's experience with school and passenger hire machines. It promises to be a type eminently suitable for operation as a pleasure machine along the coast of Britain.



On the right the Central Aircraft Co.'s twin Beardmore engined passenger-carrying Limousine. On the left the Centaur type 4a—a serviceable and economical touring machine which has done excellent work.

THE FAIREY AVIATION CO., LTD.,

Contractors to the Admiralty, War Office and Air Ministry.

Head Office, HAYES, MIDDLESEX.
London Office, 175, PICCADILLY, W.1.

Works, Hayes, Middlesex, and Hamble, near Southampton.

Designers and manufacturers of Seaplanes, Flying Boats and Aeroplanes.

Patentees of the Fairey Patent Variable Camber Gear for Aircraft.

Sole Licensees of the Linton Hope Patent Hull for Flying Boats.

Designers, by special request of the British Government, of the "Atalanta" type Flying Boat, the largest of its kind constructed.

The following types of Fairey Seaplanes designed for the British Government have been put into production for Service use:—Fairey Campania, Hamble Baby—type IIIA, type IIIB, type IIIC.

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THE SIXTH INTERNATIONAL
Aero Exhibition
OLYMPIA
July 9-20, 1920

STAND No. 47.

Telephone—19 Hayes, Middlesex.

Telegrams—"Airily, Hayes, Middlesex."
Code—A.B.C. 5th Edition.

A good all-round performance, simple and robust construction and low fuel and oil consumption should commend this machine for all such air services' routes as do not deliberately set out to compete with the fastest existing forms of surface transport.

It is not yet certainly decided which of the two machines above will appear at Olympia, but the "Centaur 4b" is, it is understood, a certain exhibit.

This machine is the seaplane edition of the 4a type already alluded to, and conserves all the good qualities of that type. The type has given a convincing demonstration of its qualities at Southend during the past few weeks, and should do excellently for coastwise pleasure and business passenger carrying. As one of the very few seaplanes at the Show it should command special interest.

THE FAIREY AVIATION CO., LTD., Hayes, Middlesex.

Founded in 1916 by Mr. C. R. Fairey, one of the earliest pioneers of aviation in this country, the Fairey Aviation Co., Ltd., have from their earliest days taken a very high position among the British aeroplane builders.

Long before the characteristic drone of twin engines slightly differing in their revolutions had commenced to disturb the nights of London, the Fairey twin-engine biplane had been built and tested with excellent results, and it was no fault of that machine that British twin-engine machines were not in our aerial armoury long before "Gotha" became a word of ill-omen to the masses of this land.

In regard to seaplanes, Mr. Fairey had better fortune, and in succession the Fairey Campania, the Fairey type 3, 3a, 3b, and 3c, have kept the firm's works busy filling Air Ministry orders, even since the Armistice.

The qualities demanded of seaplanes for war purposes are much more akin to those required for civilian purposes than were those asked for in the case of the majority of land fighters, and, therefore, it is by no means surprising to find that in addition the works have done quite a lot of work in modifying Fairey war types for more peaceful ends.

Thus the firm can look to the future with confidence. Even the present stagnation of the Industry finds them busy, and when the revival does arrive they are assured of a phenomenal amount of business.

At Olympia they will exhibit an entirely new type of machine, possessing many novel features. It has been designed to the specification of the Air Ministry and details as to its purpose and equipment are on this account withheld.

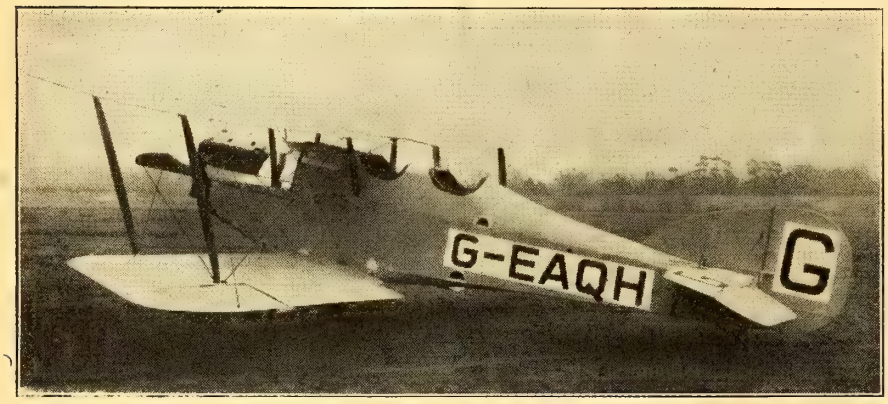
It is possible to state that the machine embodies the Fairey variable camber device on its wings, combined with an automatically adjusted tail-plane, which, when the wing-flaps are altered in position, moves to such an extent as to maintain the trim of the machine unaltered.

It is of moderate size—being 40 ft. span, 30 ft. long over all, and with a chord of 6 ft., and is remarkable in that it is built on a central section unit, which comprises the undercarriage, portion of the fuselage, and the upper centre section. This unit is entirely of steel, and consists of steel members united by machined fittings, welding or brazing being entirely absent. To the front of this unit the fuselage nose with the power-plant is bolted, and to the rear of it the aft end of the fuselage.

It is understood that the machine is amphibian and that it has been designed for a very high performance.

Being a Fairey, it will undoubtedly be worthy of study when it appears to the public view.

MARTINSYDE, LTD., Maybury Hill, Woking.



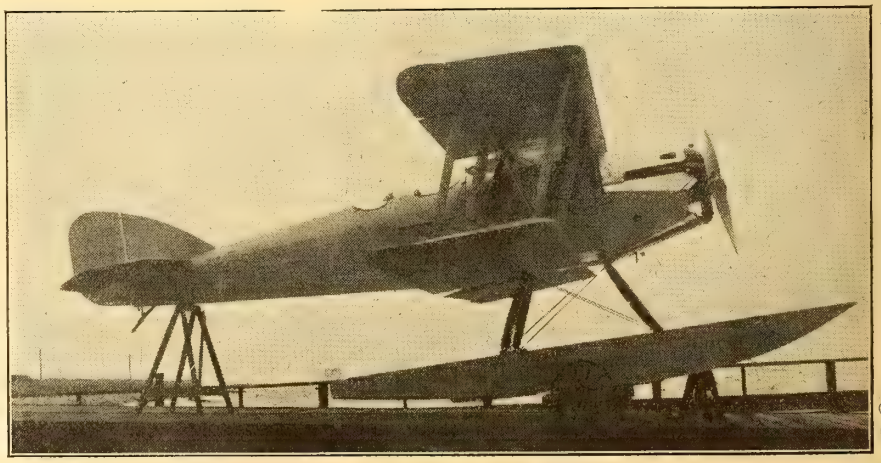
THE MARTINSYDE F4A. (300-h.p. Hispano-Suiza Engine).—This is the famous war-time fighter with its organs of offence removed and room thus made for a second seat. In this form it is one of the fastest of high speed two-seaters and for really rapid passenger transport a difficult machine to beat.

Martinsyde, Ltd., known to frequenters of Brooklands in the happy days which preceded the war as Martin and Handasyde, have from the earliest times held a reputation for the magnificent workmanship which they put into all their machines.

In those early days they were firm believers in the monoplane type, and with characteristic perseverance attacked that most difficult of aeroplane problems, the building of large monoplanes. Their efforts were crowned with success and in 1912 and 1913 the Martinsyde monoplane was one of the finest aeroplanes in existence. Extreme ill fortune with their engines at the 1912 Military trials, and the ban on monoplanes which was instituted by the military authorities very shortly thereafter, deprived them of any adequate reward for their efforts.

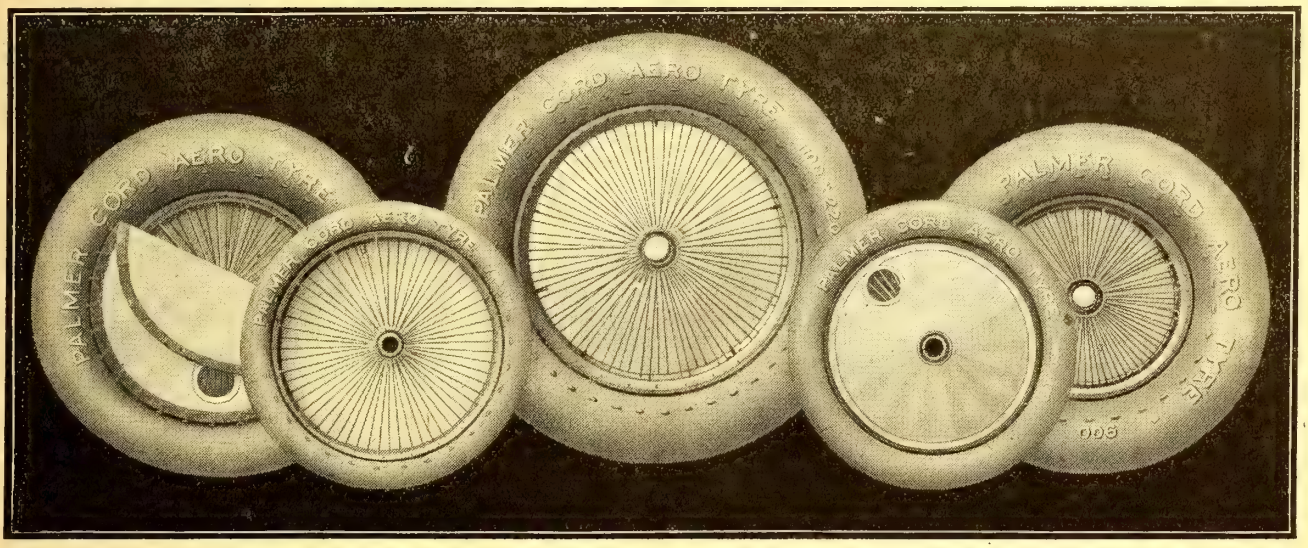
Nevertheless they persisted, and the outbreak of war in 1914 found them in possession of the first specimen of the little Martinsyde scout, a small single-seater biplane with the 80

THE MARTINSYDE TYPE A.S. (375-h.p. Rolls-Royce Engine).—The type A Martinsyde, designed for general high speed commercial work. In this particular edition of the type pilot, passenger and some 400 lb. of mail can be carried, and the machine is fitted with floats for work on lakes, rivers, or the sea.



PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104 46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104 46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132 46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135 50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132 46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132 46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135 50
,,	*40	185.	60.32	135 50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125 60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels No. 36 and 40 are of stronger type than the other wheels for 800 x 150 tyres.*

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AMSTERDAM: Stadhouderskade 91.

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LID NE

THE MARTINSYDE "SEMI-QUAVER" (300 h.p. Hispano-Suiza). A racing machine pure and simple, which in the form here illustrated raised the British Speed Record to 161 m.p.h. At the Show a modified edition of the Semi-quaver will appear, and after the Show the speed record will probably again suffer.

h.p. Gnôme, of excellent performance for that date, and possessed of the quality of almost complete unbreakability. These did excellent service in the earlier days of the struggle, and were followed fairly quickly by the Martinsyde "Elephant," again a single-seater, but with the 160 h.p. Beardmore, an engine whost merits the discerning eye of Mr. Handasyde had recognised even before the war. This machine was in all probability the first British aircraft fitted with a stationary water-cooled engine which achieved a really high performance. A climb to 10,000 ft. in 15 mins. and a speed at 6,000 ft. of 102 m.p.h. was, in 1915, phenomenal. This type continued in service for quite a long time.

In 1916 was produced the R.G.1, fitted with the 190 h.p. Rolls-Royce, and having a speed of 130 m.p.h.

THE MARTINSYDE F6 (300-h.p. Hispano-Suiza).—Designed as a two-seater since the war for the very rapid transport of passengers or mails. Has a speed of over 140 m.p.h., carrying passenger and fuel for some 400 miles.

1917 saw the introduction of the first of the famous F. series—the F.1. This was a two-seater with the 250 h.p. Rolls.

F.2, also a two-seater, was an improved F.1, fitted with a 200 h.p. engine only, despite which its performance was even better than its predecessor.

With the F.3, a single-seat fighter with the 190 h.p. Rolls engine, all ideas of aeroplane performance were profoundly modified. 142 m.p.h., a climb to 10,000 ft. in 6¾ min., and 15,000 ft. in under 12 min., were figures all far in advance of any previous achievement.

Nevertheless that machine never reached the stage of quantity production. Certain experts announced that a fighter scout with a heavy stationary engine could not conceivably be sufficiently manœuvrable, and it was not till the last year of the war that the F.4, a slightly modified F.3, with a 300 h.p. Hispano-Suiza and a still better performance, was ordered for the fighting services.

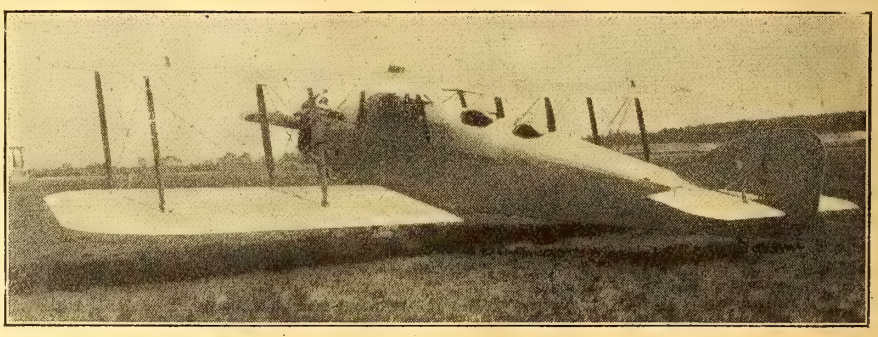
Since the Armistice Martinsydes have continued to produce aeroplanes with all the excellence of design, construction and finish for which they are famous, and their stand at Olympia will worthily uphold their reputation.

The little "Semiquaver," a machine which in its original form has an official speed record of over 160 m.p.h. standing to its credit, and which in its modified condition may be expected considerably to exceed this figure, may be regarded as a typical example of the speed machine pure and simple.

The type F.4A, the famous war type, modified to a two-seater, and which may be fitted at will with either a float or a wheeled undercarriage, is perhaps one of the finest specimens of that capacity for compromise between conflicting requirements which war needs developed amongst British designers. A reasonable load capacity, a really high maximum speed, an enormous rate of climb, and a low landing speed are here combined—and whatever may be the validity of the general objection to converted war types of aircraft for civil purposes, these qualities prove that this machine may be considered immune from attack on that score.

The type A—definitely a commercial aeroplane—has been produced to meet what is probably a more pressing need than that served by the F.4A. Using an engine of the same power, but altogether a larger machine, the useful carrying capacity has been more than doubled, at some slight sacrifice of speed and climb. Nevertheless, 123 m.p.h. is even to-day no mean speed, and when that speed can be attained with a useful load of two passengers, 600 lb. of merchandise, carrying fuel for 500 miles, it will be recognised that this machine represents a real advance in the design of economical aircraft.

THE MARTINSYDE TYPE A.—Identical with the seaplane-type A.S., except for the undercarriage. Capable of carrying large useful loads over long distances at speeds up to 120 m.p.h., despite a relatively small engine, being thus distinctly a commercial aeroplane.

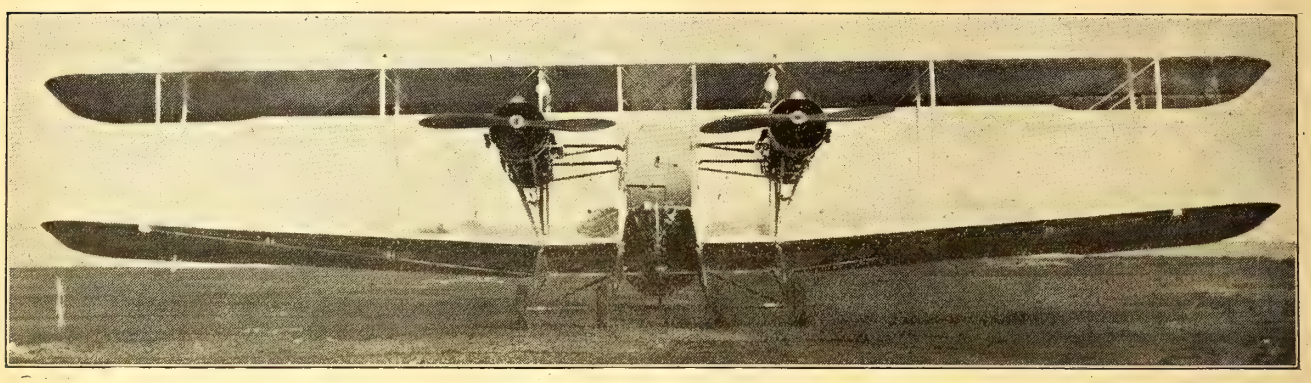


BEARDMORE

AEROPLANES

SEE BEARDMORE STAND, 65 AERO EXHIBITION, OLYMPIA.

HANDLEY PAGE, LTD., Cricklewood, N.



The W.8. Handley Page Biplane (two 450-h.p. Napier engines).

Unlike the majority of those firms who have contributed any large share to the upbuilding of the Aircraft Industry, the name of Handley Page is nearly as familiar to the readers of the daily news sheets as to those of The Aeroplane

This fact is not to be attributed to any lack on the part of Mr. Handley Page of that modesty which so distinguishes his brother pioneers, but merely to the happy fact that in the giant aircraft for which his firm is famous the journalists of this land for the first time discovered an aeronautic outlet for sensationalism which did not necessarily involve gory catastrophes or their imminent probability.

Fortunately those who have followed the history of aviation in the past know more of Handley Page's work than has appeared in the daily news sheets, and it may suffice here to note that the firm started business as aeronautical engineers on June 17th, 1909, after two years of personal experimental work on the part of the founder.

The first works were at Barking and had a floor area of about 10,000 ft., whence one may deduce that faith in the future of the new industry was fairly strong.

From then till 1912 these original works were kept busy partly on the firm's own experimental work, partly on work for private experimentalists, and towards the end of the time on the first parts towards a Government order for Army machines.

In 1911 Barking produced the 50 h.p. Gnôme-engined monoplane—variously known as the "Antiseptic" or the "Yellow Peril"—which, flown by the late Edward Petre, made a number of excellent flights, and which was still flying at Hendon late in 1913. In 1912 there emerged a larger machine of somewhat similar type, engined by a 70 h.p. Gnôme, and entered for the Military Trials of that year.

In this year also the works removed to Cricklewood, where they remain, and the business of completing the Government order aforementioned was carried on side by side with the construction of the first Handley Page biplane. This machine was extremely successful, and would undoubtedly have been reproduced in an improved form had war not supervened.

With the war the works entered on a period of intense activity, partly on the production of machines and partly on the experimental work which led to the production of the Handley Page twin-engine machine.

On the resumption of peace the firm rapidly adapted their existing models to the immediate purposes of civilian transport, and set about the production of a machine designed specially for such purposes. This machine, the type W.8, with two 450 h.p. Napier engines, will be visible at the Show, and will serve to show how thoroughly the firm has adapted itself to the new conditions.

For the rest, Handley Page continue their experimental work, combining it, as has ever been their practice, with as much paying aeronautical business as enterprise and ingenuity can discover in these hard times.

Thus at the moment work on the development of an entirely new type of wing, which promises to revolutionise flying by very greatly reducing the wing surface, and consequently the useless weight necessary to the transport of a given weight of cargo, is being carried on vigorously, while the Handley Page Air Service between London and Paris makes the most that can be made of the wings of to-day.

It is thus that progress is made; so Handley Page, Ltd., may well serve as an example to all and sundry of those who are busily engaged in predicting the downfall of British industry.

HENRY POTEZ, 96, Avenue Victor Hugo, Aubervilliers (Seine), France.

The Aircraft Industry of France is to be but slightly represented at Olympia. At the time of writing it is yet uncertain whether the Breguet exhibit is to consist of aircraft or aero engines alone, and if the latter be the case then Henry Potez will be the only French exhibitor of an aeroplane.

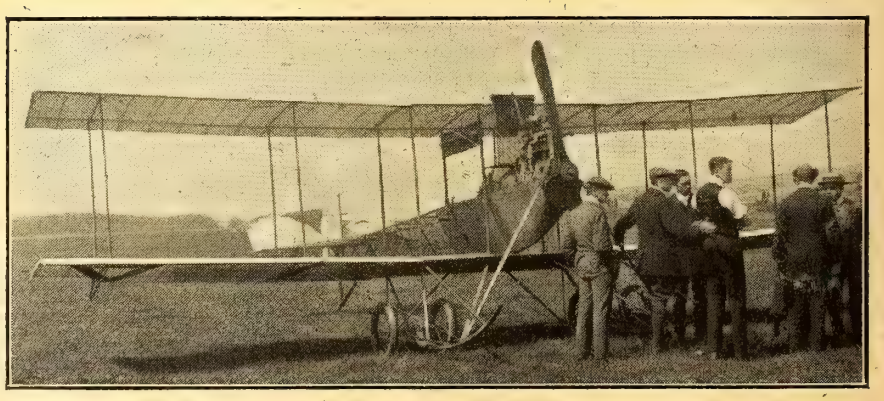
If this be so it is at least well that that exhibit should be one which exhibits a number of novel and interesting features.

Till the Paris Aero Show of the end of last year the name of this designer had scarcely been heard in this country, though certain of his products, the S.E.A. war machines, had received casual mention in the Technical Press.

Of the exact history of the S.E.A. concern, and of the passing of that name and the appearance of that now in question, no details are available.

The S.E.A. biplanes appear to have appeared at a fairly late period in the war, a fact which, despite excellent performances, led to their remaining relatively unknown. Since the Peace the war-time type VII, a two-seater bomber with a Lorraine-Dietrich engine of 370 h.p., divested of its war trappings and equipped with enclosed passenger accommoda-

The original Avro Biplane (35-h.p. Green Engine), at Brighton, in May, 1911. It was flown there from Brooklands by Mr. C. Howard Pixton, who is here seen standing with his back to the machine. This flight was made with the identical engine with which Mr. Bert Hinkler flew the Baby Avro to Turin this year.



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B.T.H. Magnetos

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The first airship to cross the Atlantic, Naval Airship R.34.

First and second prizes—Aerial Derby, 1919.

British altitude record—30,500 feet.

First non-stop London-Madrid flight.

British record for a closed circuit.

Eighteen new British speed flying records.

British record for useful load carried, duration and height—3,690 lb., 1 hour 20 mins., 13,999 ft.

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Member of the British Ignition Apparatus Association.

Olympia Aero Show, July 9th-20th.

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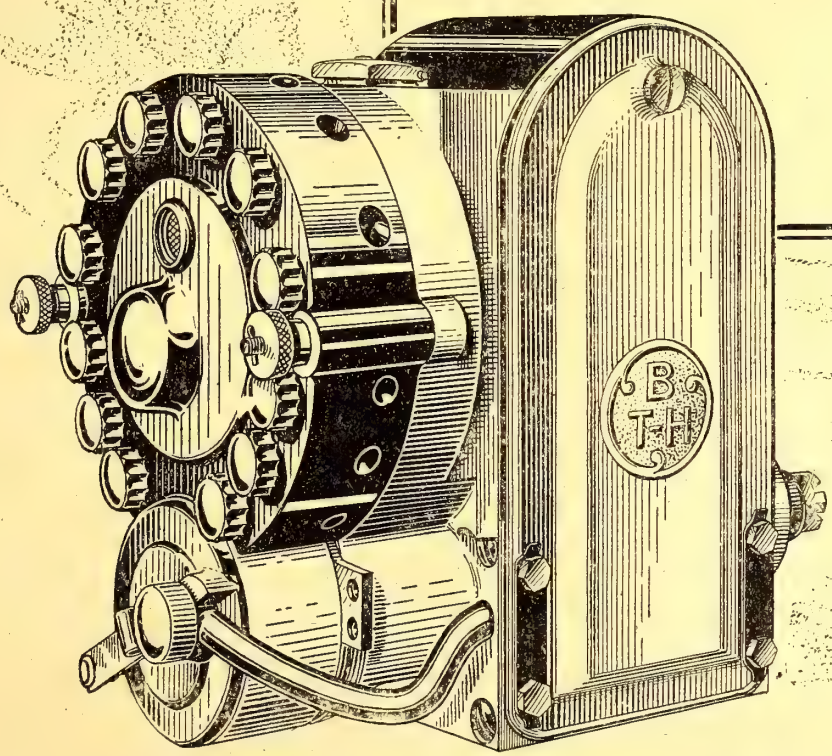
'Phone: 2102 Hammersmith.



B T-H

tion, has given good service in France, and is being put into service by the Compagnie Franco-Roumaine de Navigation Aerienne on the Paris-Warsaw and Paris-Bucharest lines.

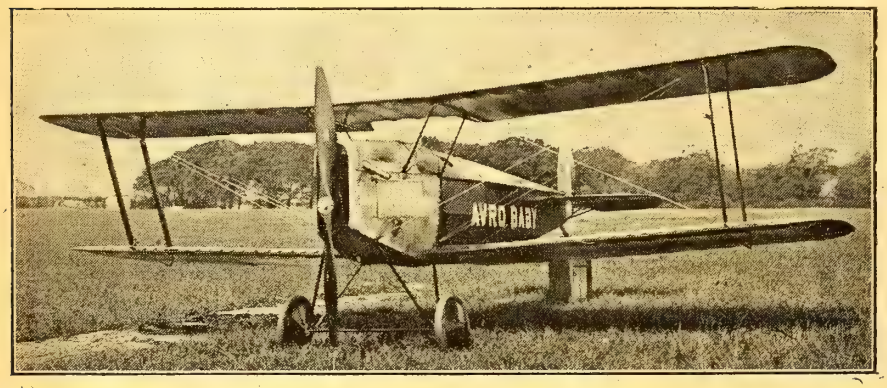
Another type, the IV P.M., recently made the journey Paris-Strasbourg-Prague-Warsaw and back, carrying two passengers at an average speed of 210 km.h. (130 m.p.h.) and made the last stage (Prague-Paris) nonstop in 4 hr. 55 min.

At Olympia will be found the Potez type VIII two-seater sporting model, built for the owner pilot, and designed for comfortable and safe touring work. The most interesting feature of the machine is its novel power plant. In this a determined effort has been made to depart from the weaknesses of the present standard types of aero engine, and to provide a power plant of the robustness and reliability which is now to be found in high-grade motor-car engines.

A. V. ROE & CO., LTD.

When there occurs a British Aero Show without an Avro exhibit it will be fairly safe to assume that the last link with origins of the British Aircraft Industry has parted. Then aeroplane building will probably be a solemn and a sordid affair, devoid of any romance—save that provided by the publicity man—and the heads of the great aircraft manufacturing concerns will probably have fallen to those depths of intellectual mediocrity which qualify men to serve as Cabinet Ministers, or the like.

The new Avro Three-seater, Type 547, with 80-h.p. Renault Engine. This is the Avro firm's latest production in touring machines at a reasonable price. The well-known reliability of the Renault engine makes it an excellent touring machine, if a trifle slow for trick-flying.



The "Baby" Avro (35-h.p. Green Engine) won the Sealed Handicap in the Aerial Derby of 1919, piloted by Capt. Hammersley, of the Australian Flying Corps. The engine was the same as that used in the first flight to Brighton and back, and in the recent flight by Mr. Bert Hinkler to Turin.

That sorrowful era has not yet arrived, and A. V. Roe and Co. will be represented by an even closer link with the early triumphs of the British Aircraft Industry than that provided by the firm's continued existence. A reference to a report of the last Aero Show—that held at Olympia in March, 1914, discloses a reference to the Standard 80 h.p. Avro, and a description of that machine in its seaplane edition. The Standard Avro of to-day is merely that machine, much more highly standardised, improved beyond recognition in its detail design, but identical in form, dimensions, and excellent aerodynamic features.

And amongst the Avro exhibits of 1920 there will be found the modern edition of that type, modified as to its power plant and its seating accommodation, to form a general utility commercial three-seater machine.

That the design has persisted so long proves its original excellence; that the firm should have recognised its excellence and have so improved its detail design that even to-day it can compare with the best products of the world in its own class proves the intelligence and enterprise of that firm.

The Avro Five-seater Triplane, with 160-h.p. Beardmore Engine. This remarkable machine is built entirely of Standard Avro parts. For instance, the wings consist of six standard planes for Avro biplanes. The tail, rudder, elevators and fin are standard Avro components, but being placed farther aft than in the biplane have the necessary leverage to control the bigger machine.

£100,000,000 STOCK £100,000,000

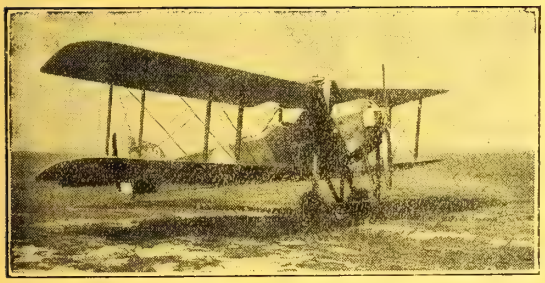
BRITISH AIRCRAFT

July 9—20, 1920 **AERO EXHIBITION** Olympia

Bristol Fighter
Type F.2

Engine: 300 h.p. Hispano

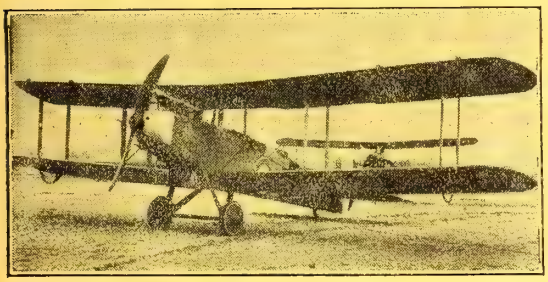
Price
£800



Armstrong Whitworth
F.K.8

Engine: 160 h.p. Beardmore

Price
£500



De Havilland Two-Seater
D.H.9

Engine: 240 h.p. Siddeley Puma

Price
£800

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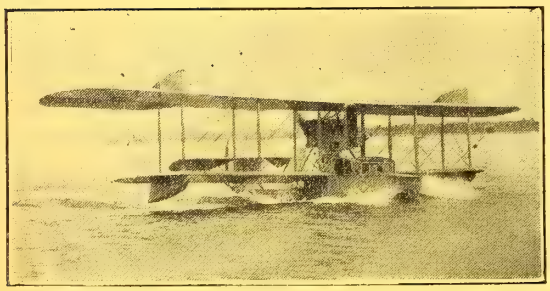
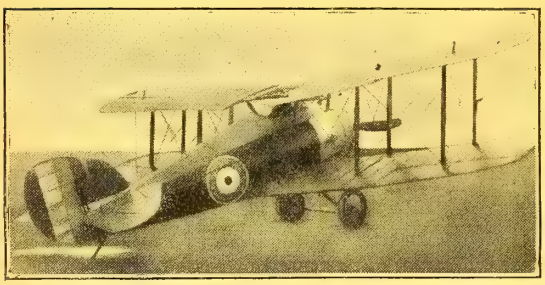


Flying Boat
N.T.2b

Engine: 210 h.p. "Viper"

Price
£1,100



Sopwith "Snipe"
Single-Seater Scout

Engine: B.R.2, 200 h.p.

Price
£700

Avro 504.K
Two-Seater

Engine: 100 h.p. "Mono"

Price
£600

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30,000
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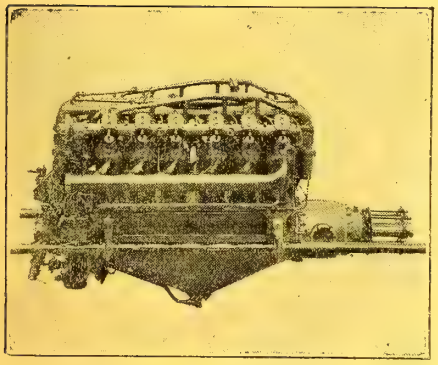
IMMEDIATE DELIVERY.



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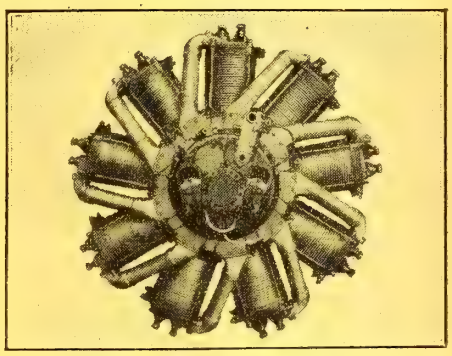
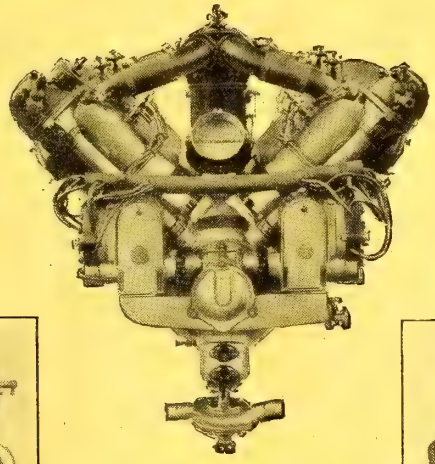
ML VIII. Price £1,100

80	h.p.	Le Rhone
100	„	Mono
100	„	Berliet
140	„	Clerget
160	„	Beardmore
200	„	Sunbeam
300	„	Dragon Fly
400	„	Liberty
450	„	NapierLion

Etc., Etc.

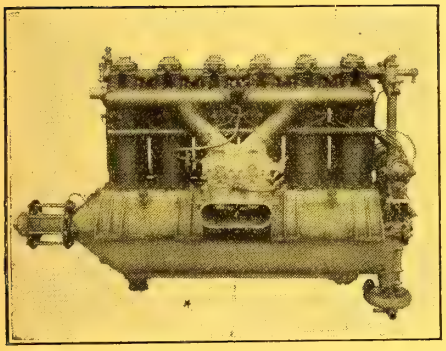


BR.2
200 h.p.
Price £300

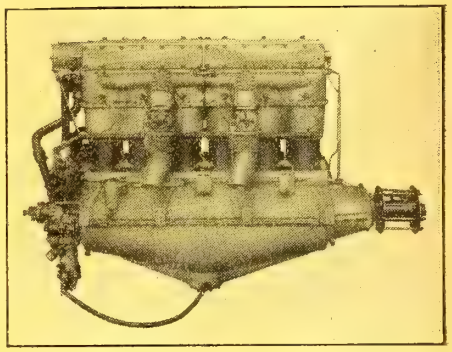


FIAT
300 h.p.
Price £300.

SIDDELEY PUMA
230 h.p.
Price £400



HISPANO-SUIZA
300 h.p.
Price £500



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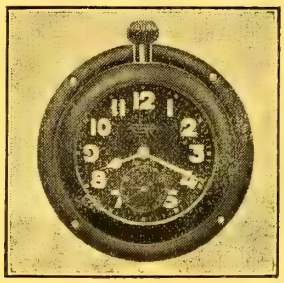

Air Board tested 8-day and 30-hour dashboard models complete with holder and pads, by the foremost makers of the day.

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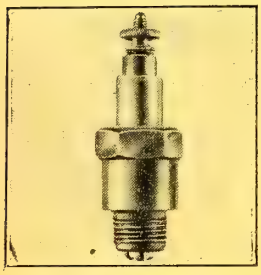
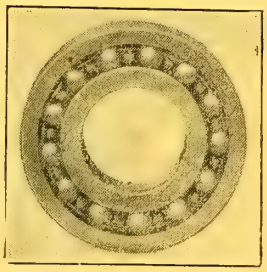


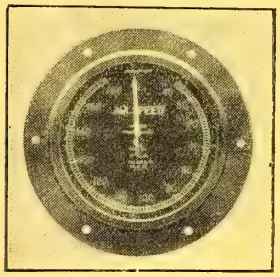
Oleo, K.L.G.,
Lodge, Titan,
Apollo, R.E.V.,
Forward, Pognon,
Splitdorf, Joly,
Hobson, etc.

Ball Bearings



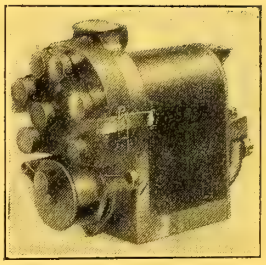
Skefko,
Hoffmann,
Auto,
Norma,
Ransome&Marles,
Rudge-Whitworth

Measuring Instruments



Inclinometers,
Speed Indicators,
Altimeters,
Thermometers,
Oil and Pressure,
Gauges, etc.

Magnetos



Siemens,
Eisemann,
Simms, C.A.V.,
Watford, Bosch,
Westinghouse,
M.L., B.L.I.C.,
Etc.,

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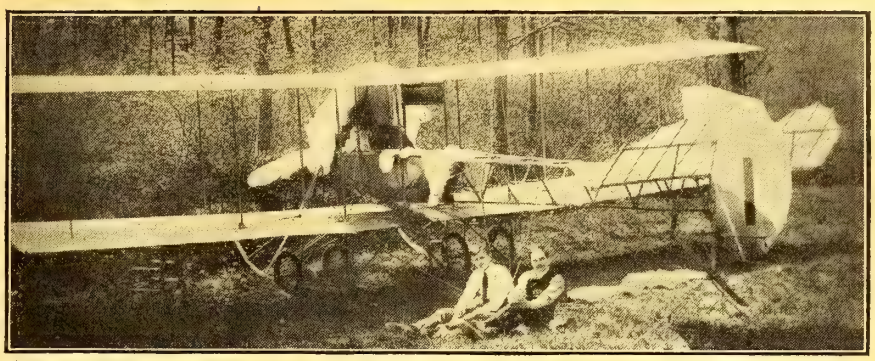


The original Avro biplane (35-h.p. Green Engine), at Oakwood, Hayward's Heath, Sussex, on its way back after making the first flight from Brooklands to Brighton and back, on May 7th and 8th, 1911. The engine was the identical one used by Mr. Bert Hinkler on his flight to Turin, and in its day Capt. Pixton's flight was as meritorious.

This particular machine, known as the Avro type 548, fitted with the well-known and trusted 80 h.p. air-cooled Renault engine, deserves the special attention of all those who are interested in the joy-ride, exhibition flying, or hackney carriage branches of aviation.

The extraordinarily fine performances of the Avro "Baby," which won the handicap in last year's Aerial Derby on its first public appearance, distinguished itself at the Amsterdam Elta exhibition, and has since—in the hands of Mr. Bert Hinkler—caused amazement by its wonderful journey to Rome and back, have rendered that machine, though naturally less familiar, nearly as famous as the Standard type. At Olympia those who know it by name alone may meet it in the flesh—and if it fails to rouse in them the desire to possess a "Baby," they may be written off straightway as lacking in any true love of the air.

As an example of an aeroplane designed intelligently with an express eye to economy of operation and of maintenance, the most novel of the Avro types, the type 547A, triplane is perhaps one of the firm's most notable achievements. An example of this type forms the third of the machines which A. V. Roe and Co. will show.

SHORT BROTHERS, LTD., Rochester.

Some are born to success, and others have success thrust upon them, but to few has it occurred that success has served to obscure their fame. In the case of Short Bros. even it has not entirely so operated, but there has been some such tendency.

When war commenced Short Bros. had under construction for the R.N.A.S. a number of 160 h.p. Gnôme-engined seaplanes, which rendered extraordinarily good service. These were followed by very similar machines with Canto d'Unne engines, then by an improved type with the 150 h.p. Sunbeam, and later by the Short 184 type, which was originally fitted with the 225 h.p. Sunbeam.

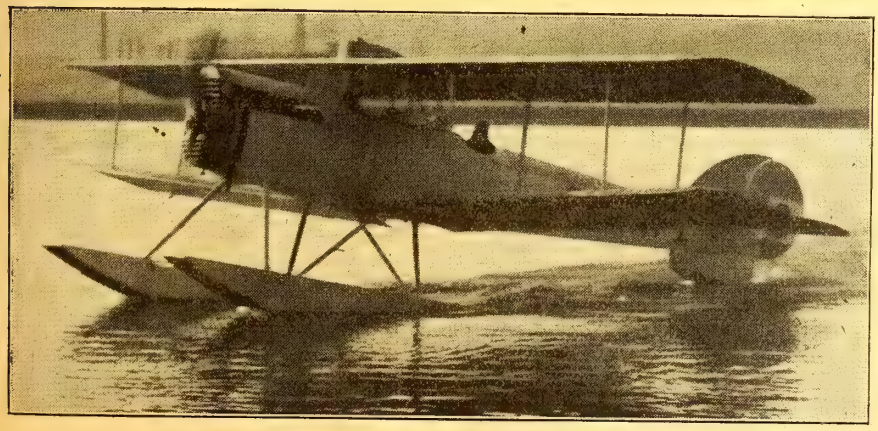
This particular type of machine survived right to the end of the war, with minor modifications as to power plant and equipment.

Short Bros. produced after that type many others which were for their time even better than the 184, but except in one or two cases, and those only in small quantities, the later types of Short were never allowed to reach production, persumably lest they should interfere with the supplies of the 184 type.

It therefore happens that many ex-R.N.A.S. pilots to this day associate Shorts with the 184 type alone, and are under the impression that the firm has been satisfied with that as their high water mark of achievement.

A visit to the Short Stand at Olympia will remove any such impression. The Short Sporting type seaplane which is there shown is not an entirely new product, but has not yet been much in the view of the general public. In its general lines it will be found to conserve all the good points usually associated with Short Seaplanes. It has, of course, folding wings. It is simple in design and construction, its float undercarriage

Threequarter rear view of the "Sporting" Short Seaplane (160-h.p. Beardmore Engine). The machine is here seen at anchor without pilot or passenger. It may be noted that the machine then rides high with its tail float well clear of the water.



Threequarter front view of the "Sporting" Short Seaplane (160-h.p. Beardmore Engine). The machine is here seen getting under way with the pilot alone on board. The position of the floats is to be noted, and the very slight wash made in taxying.

is of the well-tried Short type with sprung floats. The floats themselves present certain novelties of form, but they still possess that comforting look of ample size and solidity of construction.

But a careful examination of the machine will show that this is in no whit behind the best of modern aeroplane practice in design and construction, and an enquiry into its performance will show that it is at least in the first flight of practical commercial aircraft of to-day.

Fitted with the 160 h.p. Beardmore engine and with accommodation for pilot and three passengers, with three hours' fuel and oil, the machine has a top speed of 83 m.p.h., a very low landing speed, and can reach 10,000 ft. in 35 min.

Folded, it may be stowed into a very small space, and it is eminently a sound seaworthy job—suitable for coastwise and cross-sea flying of all classes for which its carrying capacity is sufficient. The engine is of an eminently reliable and economical type, and both engine and machine should prove to be extremely cheap to run.

The second machine which Short Bros. will show may fairly safely be written down as the greatest novelty at Olympia.

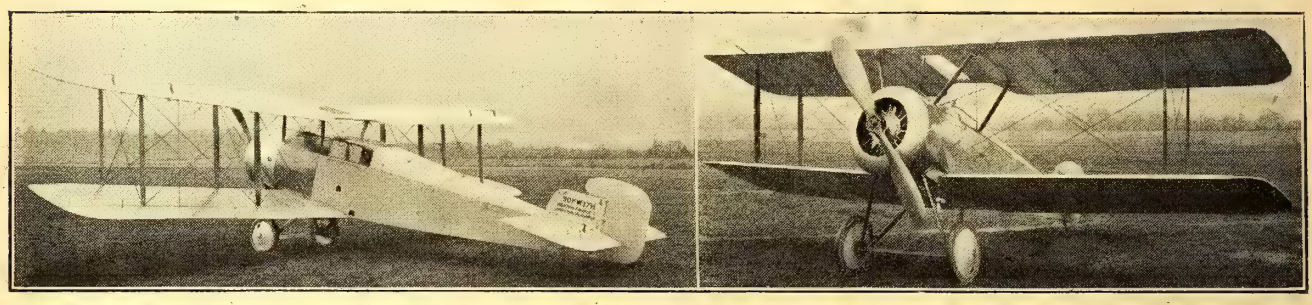
This, to be known as the "Swallow," is a medium-sized mail- or cargo-carrying land machine, carrying pilot and 400 lb. of goods, though it can easily be modified to carry two passengers in place of mail, and fitted with a Siddeley "Puma" engine. In general outline it is of the conventional single-engine tractor type, with two bay wings, of very clean outline, and looking capable of very excellent performance.

The outstanding novelty is that it really is an all-metal machine—even to the wing-covering. The material mainly employed is duralumin, steel being used in a number of parts subject to more intense stresses.

Another and very important feature is that although a metal machine, it is a very simple machine to manufacture. It has usually been conceded that in very large quantities all-metal machines might be cheaper than the standard wooden type, but that the cost of special tools which would be required would render the cost of small numbers excessive. In the Short "Swallow" this objection appears to have been very thoroughly overcome. Certainly the machine can be built in a single specimen with no greater equipment of special tools than is needed for the normal type, and the ingenuity which has been expended to secure this result is one of the most noteworthy features of the machine.

There will also appear on the Short Stand a number of extremely interesting models of Short machines of the past, of types which they have projected for the future, and of a number of highly ingenious accessories which the firm has devised to facilitate the handling of seaplanes at their terminal stations.

THE SOPWITH AVIATION AND ENGINEERING CO., LTD.



TWO MODERN SOPWITHS.—On the right the Dove (80-h.p. Le Rhône), a small two-seater for the owner pilot. On the left the Gnu (110 Le Rhône), a luxurious touring mount for the man who keeps a pilot and wishes to be accompanied on his flights by a friend.

Of the list of Sopwith products there is seemingly no end, and to those who have know them from the Sopwith "Tabloid" of 1913, through "Pups," 1½-Strutters, Camels, Dolphins, Snipes, and the whole menagerie, it might seem impossible that there should be yet more—distinctively Sopwith and recognisable at first sight—but nevertheless new Sopwiths. Yet so it is—and at Olympia those who will may inspect and admire the "Antelope."

Not that the "Antelope" is their sole exhibit, for there will be two other members of the tribe, the "Gnu" and the "Dove," present The two latter mentioned are not entirely new types, but little has been seen of them as yet in this country, Australia apparently having absorbed the major proportion of both species.

Although the Sopwith firm have built—and doubtless again will build—machines of medium to large size with success, nevertheless it is believed that even they would admit that it has been in the realms of the small, light and high-speed types that they have attained their greatest successes. The "Antelope"—a three-seater with an engine of 180-h.p.—must nowadays be classed as a small machine, and the remaining two are both smaller than it—so that the Sopwith exhibit may be regarded as typical of the firm's special *forte*.

The "Dove," frankly based on the "Pup" of early war days, and bearing a very strong resemblance to it, should revive happy memories on the part of all ex-"Pup" pilots, and may re-awaken in some hearts a desire to fly. The main difference between the "Dove" and the direct ancestor is that the "Dove" is two-seated, and thus provides the accommodation for that "designing female" who has been described as the dominant factor affecting the design of sporting type aircraft.

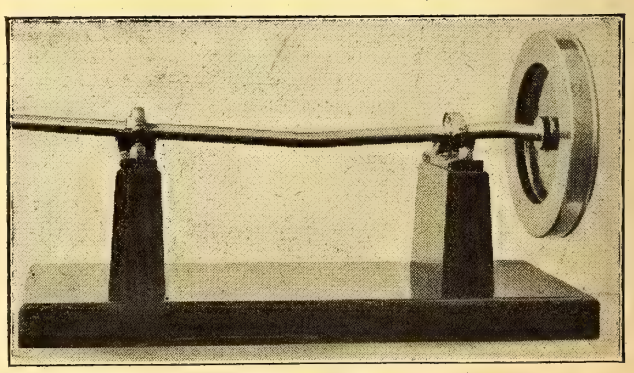
It possesses all those qualities which made the original "Pup" so definitely a delight to fly and therefore those who possess—or are possessed by—the necessary passenger and the desire to fly with her need consider no other matter than the terms whereon a "Dove" may be purchased.

The "Gnu" will be found to be a very similar type of machine on a somewhat larger and more luxurious scale. It seats, in addition to the pilot, two passengers, who are ensconced in a totally enclosed cabin, triplex-glazed and giving an excellent view. Like the "Dove," it is fitted with a rotary engine—either the 110 Le Rhone or the 150-h.p. Bentley are the standard types, the performance naturally varying somewhat, but reaching 93 m.p.h. and a climb to 5,000 ft. in 7¾ min. with full load and the smaller engine.

Its aerial range of usefulness thus corresponds roughly to the land range of the highest class of enclosed motor-car, and as a light, high-speed transporting agency it is understood to have given excellent service in Australia.

The "Antelope" is a larger, sturdier and faster machine, fitted with a Wolseley "Viper" engine of 180-h.p., and a greater fuel range

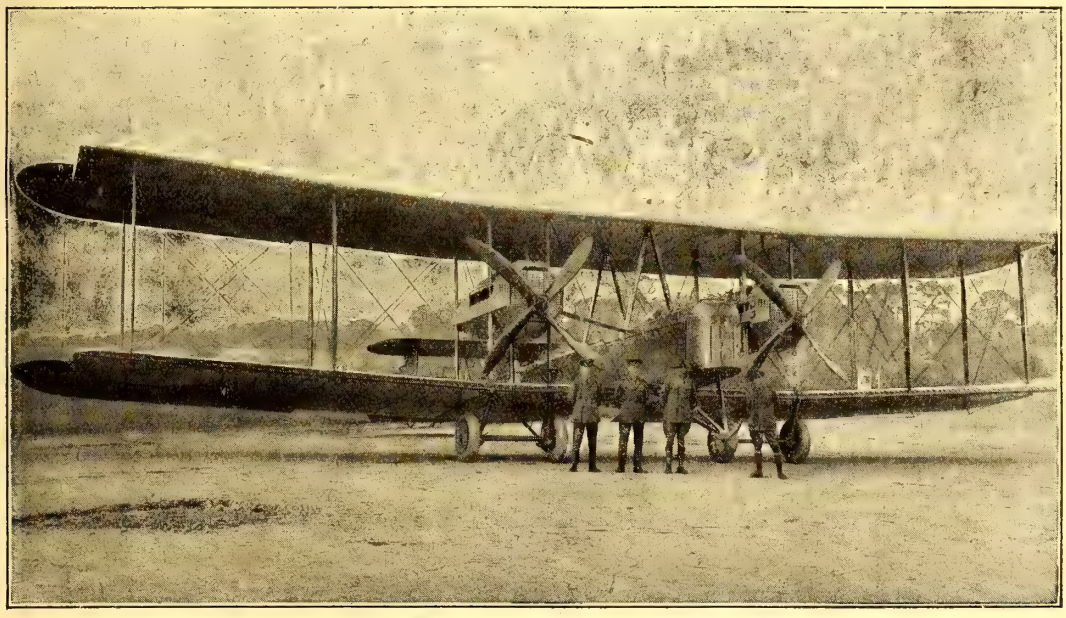
The accommodation provided is the same as that of the "Gnu"—one pilot, and two passenges who are in an enclosed cabin which can, however, be partly opened if desired. For services calling for a somewhat greater speed and a longer range than that whereof the "Gnu" is capable, and to those who suspect the rotary engine, the "Antelope" should prove a useful and economical general utility craft.



An interesting exhibit to be seen at Olympia. The bent shaft is made to rotate rapidly to show the self-aligning qualities of S.K.F. Bearings.

VICKERS LIMITED

"VICKERS-VIMY-ROLLS."



The Aeroplane that successfully accomplished the flight to Australia.

The first flight from England to Australia and the first direct Transatlantic flight, was accomplished on a Vickers-Vimy-Rolls Aeroplane.

STAND No. 50, AT THE AERO EXHIBITION, OLYMPIA.

Telephone No.: Victoria 6900 (13 lines). **Telegrams: Vickers, Vic., London.**

Aviation Department:

VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

THE SUPERMARINE AVIATION WORKS, LTD.

The flying boat has—since flying began—passed through many stages. When it first appeared it was very largely hailed as the solution of the oversea flying problem.

Certain defects of early machines of the type relegated it for a time to a position of relative obscurity, from which it was retracted by the appearance of certain large experimental boats which flew, contemporaries of certain large float seaplanes which did not.

It was then hailed as the solution of the large aeroplane problem, though but few ventured to suggest that it might displace the more normal type for small and medium sizes. Later still there have arisen those who deny that even the large flying-boat is a permanent solution of any of the problems of flight, and that for sea flying the twin-float type must return in even the largest sizes. And through all these changing tides of fashion Supermarine flying boats have continued to function, and curiously enough in the very size for which the type has ever found the fewest advocates.

All of which goes to prove that the policy of making something and seeing how it works produces greater results than does that of merely arguing as to what should be made.

As to who actually built the first flying boat is at the moment undecided—but certainly a "Supermarine" was one of the earliest built. Since that first boat—the product of Mr. Pemberton-Billing's fertile imagination—the Supermarine works have built many things, but since they became the Supermarine Aviation Works they have—so far as can be traced—built nothing of aircraft but flying boats. The first of their modern efforts in this line—a two-seater machine with a 200-h.p. Hispano engine, built for the Air Department of the Admiralty at a time when "Big Boats" and "small float machines" was the fashionable cry—put up a performance well ahead of that of any competing float machine, and their next effort, the Supermarine "Baby," established a record for seaplane speed which was not equalled for some considerable time. Incidentally this same machine was the first flying boat on which "looping" was carried out successfully.

Since the Peace they have produced the "Sea Lion," a small boat which, propelled by the 450-h.p. Napier engine, must be amongst the fastest seagoing craft of the world, and with modified versions of the two-seater war machines—equipped now with Beardmore engines—they have given convincing demonstrations of the safety and reliability of the flying boat as a commercial passenger-carrier.

Thus Supermarines have an established claim to be regarded as specialists in the design of the moderate-sized flying boat, and their Stand at Olympia should command attention from all who are interested in the future prospects of over-water flying.

Their exhibit will consist of two machines. Of these the "Channel" type four-seater, capable of carrying three passengers or 540 lb. of goods, is a type which has already shown its excellent qualities of combined air and seaworthiness.

Fitted with a Beardmore engine of the famous 160 h.p. type, it is economical of fuel and reliable of running, and it has a performance adequate to meet the normal vagaries of even this climate.

The second exhibit is of a new type, and is known as the "Sea King." It is designed as a war machine, though it should make an appeal to sporting pilots who wish to indulge in sea-plane racing—if and when the Royal Aero Club will oblige by organising such a sport.

Like the "Channel" type, the engine is a 160-h.p. Beardmore, but this is a one-seater equipped with a machine-gun, and capable of carrying two 50 lb. bombs in addition. The performance with this load is extremely good—speed, 50 to 96 knots, and 10,000 ft. in 20 min.—so that one may safely assume that, divested of the appanages of war it should give an excellent account of itself as a racing machine under any reasonable form of rating or handicapping.

VICKERS, LTD.

That Vickers Ltd.—one of the greatest of all the manufacturers of war equipment of the world—should have recognised as early as 1910 that aircraft would play an important part in the wars of the future, proves that military communications do not invariably corrupt good imaginations.

That in the few years which followed the same firm should have spent many thousands of pounds on experimental aeroplane and engine work without encouragement or promise of reward from those powers which were ultimately to benefit therefrom, proves a number of further propositions—amongst them that the generally held opinion that great riches are incompatible with faith is a fallacy.

That the war having come and gone—and with it, to all appearance, all hopes of further immediate profits for the aircraft manufacturer—the firm should continue to design and build aircraft for commercial purposes proves still further that Vickers, Ltd., possess foresight, imagination and enterprise to an extent which many would declare to be impossible on the part of so huge an organisation.

Altogether the history of the Vickers Aviation Department proves that the faults typical of Governmental Departments are not inherent in the immensity and complexity of a great organisation, but are due to the fact that Government Departments have not the incentive to hard and intelligent work which the necessity for paying dividends may provide.

That Vickers products should have played a large part in all branches of the late war may be taken as but natural; suffice it therefore to emphasise the post-war achievements of Vickers Aircraft. And for such emphasis needs it more than to recount that the first direct flight across the Atlantic was accomplished on one Vickers aeroplane, that the first flight from England to Australia was made by another, and that the major portion of the only flight from England to South Africa was also made by a Vickers. Further and additional emphasis, if such be required, is that though much has been written and said of late as to the value for commercial purposes of amphibian aircraft, the first such amphibian of post-war date to be both built and tested is—so far as at present known—the Vickers "Viking."

Of their exhibits at the Show, the "Vimy Commercial" will be the most imposing. This, of course, is the famous "Vimy" of trans-Atlantic and Australian fame, but fitted with a special fuselage for the conveyance of passengers and goods. The fact that the "Vimy" is a twin-engine machine, and that such a new fuselage—conditioned as to its form and arrangement by none of the cramping requirements of war work—can be fitted robs the epithet, "a converted war machine," of all its sting in this case.

The Amphibian "Viking," though less imposing in appearance than the "Vimy," is at least as worthy of attention, partly for the reasons set out above, and partly for its own merits.

Although but a relatively small machine, some 45 ft. or so in span, it is a five-seater flying boat with a retractable land undercarriage which not only allows it to ascend and alight on either water or land, but which enables it to dispense with all the troublesome incidentals which usually intervene at the bringing ashore of a seaplane—or still more at the immersion of a land machine.

The combination of the qualities of a land and a water machine appears to have been effected with no sacrifice either in the comfort of the accommodation provided for the passengers, in the performance of the machine itself, or in its airworthy qualities.

For the rest the Vickers exhibit will comprise models and photographs bearing upon the aerial history of the firm, and samples of the products of direct or indirect aerial interest which they and their associated companies produce.

THE WESTLAND AIRCRAFT WORKS.

Of the many concerns who entered upon the trade of aircraft building under the stress of war few now remain. But those few are a worthy accession to the industry, for their continued interest therein is a token that they propose to take a share in the difficult and expensive task of building up the commercial aerial transport industry of the near future.

Amongst these newcomers the Westland Aircraft Works must take a very prominent place, for they were amongst the earliest of those who thus entered upon this branch of activity, and because they have ever since shown that having entered they meant to enter thoroughly.

Arrangements to manufacture aircraft for the Air Department, the Admiralty, were made in 1915 by the board of Petters, Ltd., of Yeovil, and in a very short space of time the delivery of Short seaplanes was begun, To seaplanes, Sopwith 1½ strutters and DeH.4s were added, and during 1916-17 the firm's aircraft business had so extended that additional works and an aerodrome had to be acquired. Though actually a branch of Petters, the aircraft works were run as a separate

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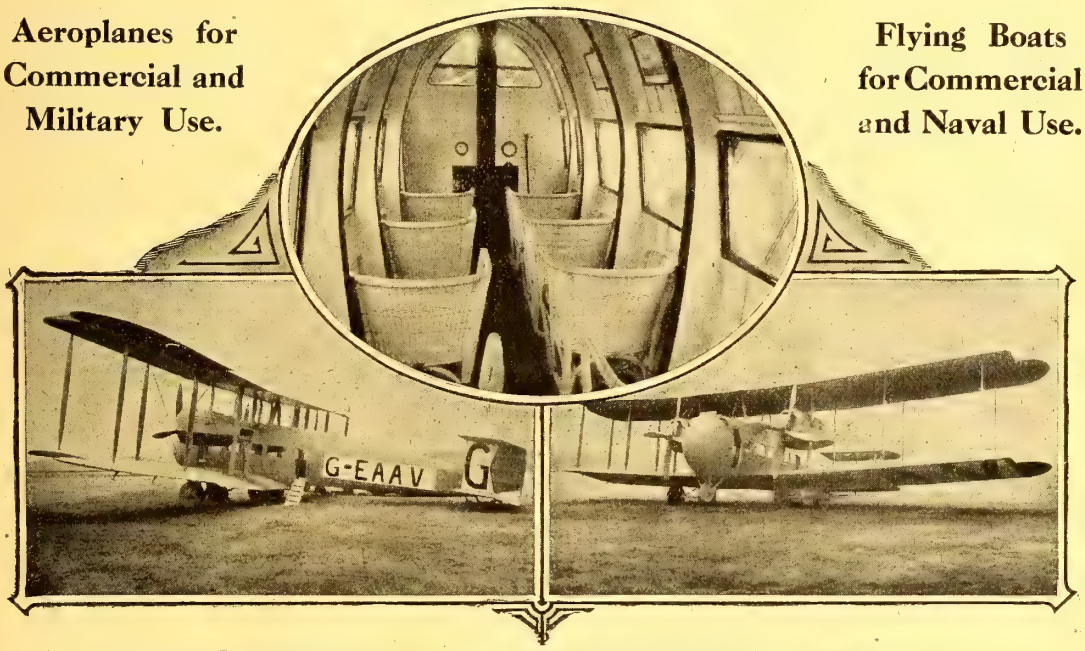

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STAND No. 50, AERO EXHIBITION, OLYMPIA.

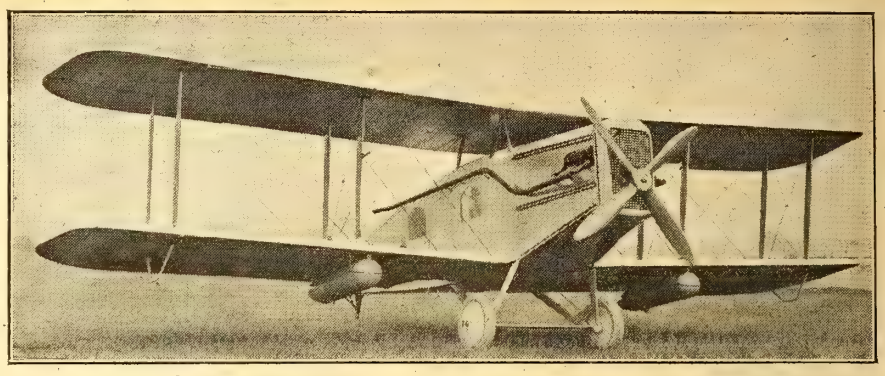
We are Exhibiting a

360 H.P. ROLLS-ROYCE AERO ENGINE.

Aviation Department:

Vickers House, Broadway, London, S.W.1.

THE NEW WESTLAND LIMOUSINE (300 h.p. Hispano-Suiza).—A commercial machine carrying pilot and three passengers, or an equivalent weight of goods. As a passenger-carrier the machine is extremely luxuriously fitted, and as a mail or goods carrier it gives a very large, clear stowage space.



and distinct concern, under the name of the Westland Aircraft Works, and under the management of Mr. R. A. Bruce, who was released by the Admiralty that he might undertake this task.

Westlands were not content with merely building to the designs of others. Their first original products were two fighting seaplanes of the single seat type, N.16 and N.17. These machines were fitted with a form of variable wing camber gear designed by the firm, and on test they gave very excellent performances. One of the many changes of what served the Air Department in place of policy intervened, however, and the machines were not reproduced.

Their next machine was a single-seat land fighter, designed to the more settled needs of the Air Ministry, known as the Westland "Wagtail," which was fitted with a then new type of air-cooled radial engine. This machine was characterised by its high performance and manœurability, the excellent view afforded the pilot, and the accessibility of the gun gear. Troubles with the engine were encountered which effectively prevented the Wagtail from taking any part in the war, but, with these engine troubles overcome, the "Wagtail" can compare favourably with any modern single-seater of the same power.

Next came the Westland "Weasel," a machine designed to the call of the Air Ministry for two-seat fighters with the A.B.C. "Dragonfly." This machine followed fairly closely the lines of the "Wagtail" and possessed similar excellent qualities. A novel feature was the Westland adjustable tail plane gear, which overcame the main objection to most previous gears of the type, in that it reduced to a minimum the amount of tail plane bracing and thus reduced the risks of firing astern from the rear gun position.

Since Peace the firm have shown their faith in the future of the aeroplane by designing and building machines especially for civilian transport service.

Of these the Westland "Limousine" is already well known by name at least to all who take an interest in the progress of aerial transport.

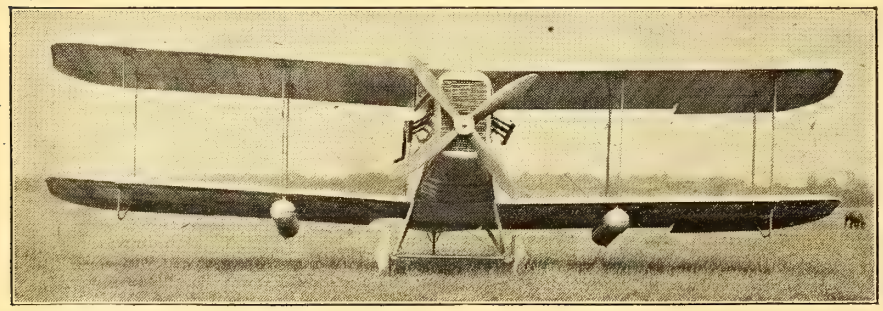
It is not quite so well known that there is also the Westland six-seater and mail carrier which has been specially designed for service in the Colonies, where communications are scanty, traffic relatively small, and consequently the very high capital cost of aeroplanes of the usual type is a serious deterrent to their use.

It is the intention of the Westland Aircraft Works to continue the development of aeroplanes of both the war and the commercial types on rational and safe lines. Thus they will —when commercial aviation comes to its own—certainly reap the due reward of their enterprise.

At Olympia they will exhibit the Westland "Mark II Limousine," a modified and improved version of the well-known Limousine which has already been described.

In the new model the engine has become a Hispano-Suiza of 300 h.p., and the fuel tanks have been removed from the fuselage to a position under the lower planes. They there take the form of two torpedo-shape tanks, one under each of the inner pair of interplane struts. The cabin space is thus enlarged appreciably, and at the same time the risks of fire are appreciably reduced.

The machine is thus an excellent example of the modern British commercial aeroplane—comfortable, strong, of an excellent performance, and designed for economical operation.



Front View of the Westland Limousine. Gives an idea of the cleanness of the design. The objects suspended beneath the lower wing are the petrol tanks, and their removal from the fuselage adds considerably to the safety of the passengers.

THE BREGUET EXHIBIT.

The name of Louis Breguet appears in the list of exhibitors at the Olympia Show, but at the moment of writing it has not been possible to determine whether the exhibit is to consist of aeroplanes or of the Breguet-Bugatti power plant—or of some hitherto unsuspected branch of the Breguet activities.

Whatever the exhibit may ultimately prove, it cannot fail to be of interest, not only as one of the very few of French origin, but as the product of one of the first of the aircraft constructors of the first nation to take aircraft seriously. When the first Breguet aeroplane was designed or built is lost in the mists of early aeroplane history, but in 1910 a Breguet tractor biplane actually flew with six people on board. During the war Breguet machines were in very extensive use by the French Air Services, and since the Peace the firm has built and constructed commercial aircraft which have flown regularly on the Paris-London service, as well as others employed on the internal aerial routes of France.

In the Breguet-Bugatti power plant the firm have gone some way towards the solution of that multiple engine problem which so many people are convinced is an essential preliminary to the coming of the aerial freight carrier of the future. Therefore be the Breguet exhibit an aeroplane one or an engine one, it should in any case be of extreme interest.

THE ROYAL AERONAUTICAL SOCIETY AT OLYMPIA.

Arrangements have been made for a reception room for the members of the Royal Aeronautical Society to be available during the Aero Show, which is to be held at Olympia from July 9th to 20th. Stands Nos. 94 and 95 have been allotted for this purpose by the Exhibition Committee, and will be found immediately on the left of the Hammersmith Road entrance. A telephone, which may be used free by members, will be installed, the number will be Hammersmith 2130. The room will be fitted up as a sitting-room, and current numbers of aeronautical papers will be transferred for this period from the Library at 7, Albemarle Street.

WESTLAND

We are exhibiting a new Westland model at the Olympia International Aero Exhibition, Stand 61.

This machine is well worth the careful attention of Companies interested in Aerial Transport, and our Representative on the Stand will be pleased to supply fullest particulars to all interested.

The machine is a modification of the now well-known Rolls-Royce engined "WESTLAND LIMOUSINE," but is fitted with a 300 h.p. Hispano Suiza engine and has greater carrying capacity and endurance than the previous model.

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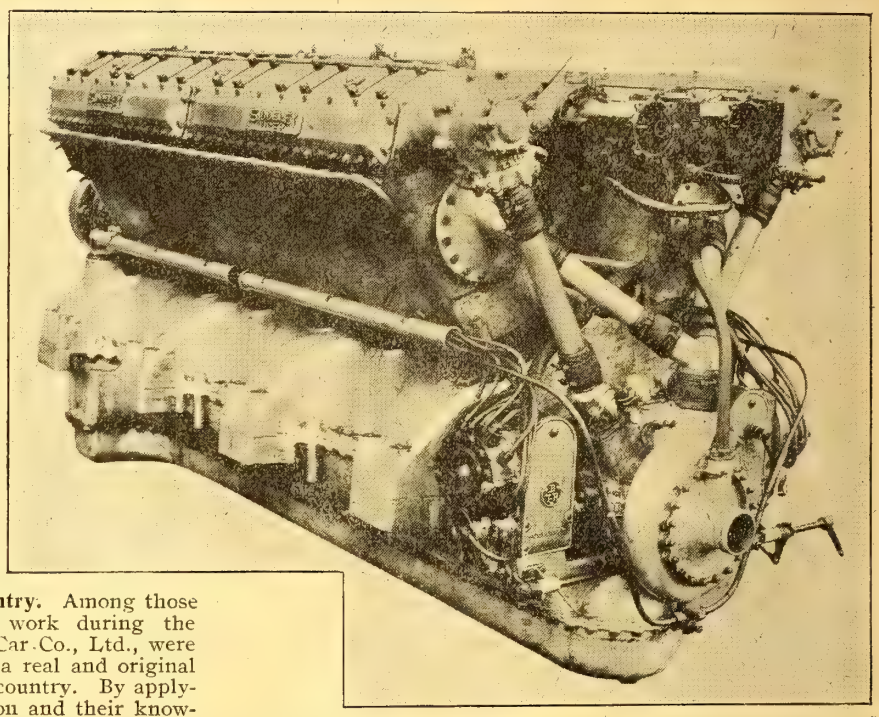
THE ENGINE EXHIBITS.

THE SIDDELEY TIGER.—A twelve-cylinder engine of 500 h.p. based on the B.H.P. designs, modified and improved as to construction by the Siddeley Company. One of the most marked features in this engine is the extensive use of aluminium in the construction. Very similar in its details to the famous six-cylinder "Puma," it must be regretted that it was not produced in time for war service. May it fare better in peace.

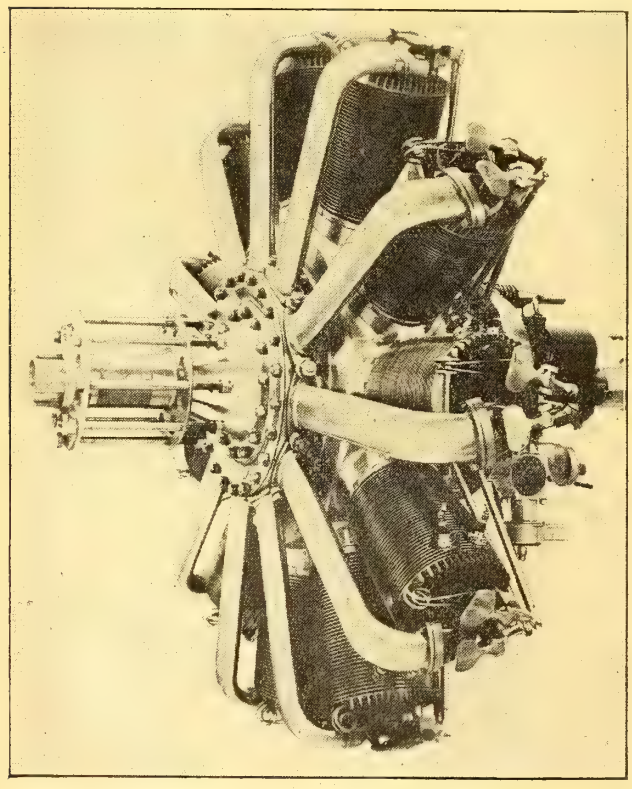


Armstrong-Siddeley Motors, Ltd., Coventry. Among those many firms who entered upon aircraft work during the period of war, the Siddeley-Deasy Motor Car Co., Ltd., were of the relatively small number who made a real and original contribution to the aerial resources of this country. By applying their immense capacity for organisation and their knowledge of high grade internal-combustion engine design to the problem of the quantity production of B.H.P. engines, they provided the Royal Air Force with large numbers of that most excellent engine, the Siddeley "Puma" of 230 h.p. Had war continued a little longer the Siddeley "Tiger" of 500 h.p. would doubtless have become a common object of the aerodrome side.

Since that calamitous event, the Armistice, the Siddeley-Deasy Company has entered into alliance with the Armstrong-Whitworth concern, and has returned with great vigour to the business of producing high-grade automobiles.

Despite this they have in nowise renounced their interest in aircraft engines, and at the forthcoming Show at Olympia they will show examples of both the "Puma" and the "Tiger." Even more, they will exhibit for the first time a range of entirely new aero engines. Of these it may suffice at the moment to state that they are air-cooled, that they range in size from an engine suitable for the smallest of sporting single-seaters to one of 300 h.p., and that they have been designed by an engineer who during the war had almost unequalled facilities for carrying out experimental work on all types of aircraft engines.

The many interesting features of these new engines will be disclosed in due course.



An 11-cylinder 230-h.p. Clerget engine built by Gwynnes, Ltd.

Gwynnes, Ltd., Hammersmith Iron Works, W.C. During the war many firms who had not previously undertaken such work were turned on to the production of aero engines. With very few exceptions these firms were such as had a fairly extensive experience in the manufacture of petrol engines for car work. It is therefore somewhat remarkable that right at the very beginning of that period—in 1914—Gwynnes, of Hammersmith, should have been given the task of building Clergêt aero engines.

The only possible explanation would appear to be that those in authority at that early date realised what must have been forgotten by some of their successors—that an engineering firm with the wide experience of Gwynnes possessed qualifications for dealing with so new and difficult a problem as the manufacture of high-powered rotary engines, which might be lacking on the part of those who were firmly convinced that no petrol engine provided difficulties which they were not already aware of.

Whether that, or some other, be the explanation, the policy was abundantly justified, and Gwynne-built Clergêts in large numbers gave excellent service on all the fronts. Later, when the Bentley or "B.R." engine had to be produced, Gwynnes very rightly were given a large share in the production thereof, and they carried out their part therein with complete success.

The war has now ended, and the production of aero engines has fallen to a negligible quantity, but Gwynnes have not therefore abandoned this branch of their business. They will show at Olympia engines of both the Clergêt and the B.R. types of their manufacture. In particular they will exhibit a new type of Clergêt engine of their own design, which is specially suitable for those classes of commercial aircraft which require an engine of moderate h.p., light weight, and reasonable price.

It should be noted that Gwynnes, Ltd., hold the British rights of the Clergêt patents and are the British agents for this type of engine.

The Original NON-POISONOUS.

Titanine Dope

is strongly recommended for

PRIVATE and COMMERCIAL AEROPLANES.

Absolutely unequalled for Durability.

There is no **CONTROL** on Dope for the above types of machines.

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Melbourne Office: "Aberdeen House," 94, King Street.

Sydney Office: "London Bank Chambers," Corner of Pitt and Moore Streets.

D. Napier and Son., 14, New Burlington St., W.1. Many years ago, when Britain was yet pre-eminent amongst the nations of the earth in the realms of shipbuilding and engineering, and at a time when the Clyde signified something other than merely a hotbed of revolutionary labour shirkers the name of Napier was one wherewith to conjure. It seems to be the fate of all real pioneers in the realms of industry building that they either achieve material success and that thereafter somnolence overtakes them, or that when success becomes imminent and the joys of pioneering threaten to vanish from their particular branch of human endeavour that they should leave the territory they have explored and seek for fresh and undiscovered fields for adventure.

What precisely may be the connection between the firm of D. Napier and Son, Ltd., of to-day and those now nearly forgotten Napiers who had so large a share in the building up of the Scottish shipbuilding industry, cannot be exactly stated, but that the firm lives up to the traditions of its name is obvious.

For when Napier's started to build automobiles, the automobile industry, so far as Britain was concerned, was an unexplored wilderness, whose natural resources were unsuspected, their existence even denied, by all of the characteristically stodgy British "captains of industry." Automobile engineering in those days was a thankless profession. Even at that date it was worried by a red flag, and it is perhaps an open question whether a red flag waved ahead of one's automobile was not a worse evil than that which is now daily waved—in theory, if not in fact—before the management of every engineering concern in the land.

It may yet be remembered that it was upon a Napier car that Mr. S. F Edge won the Gordon Bennett Cup for Britain, constituting the first occasion whereon a British car met and defeated in open competition the best products of the motor car manufacturers of the world.

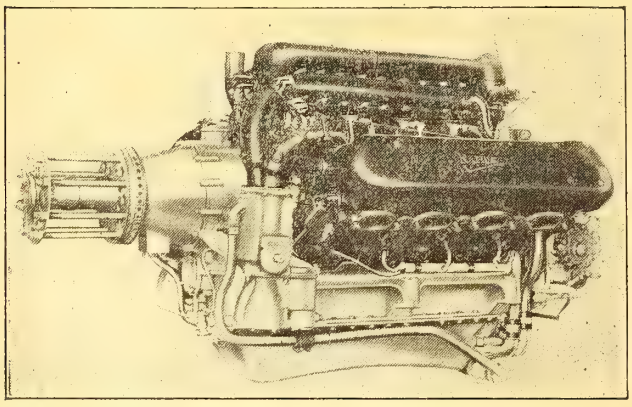
Whether it be that the monotony of successful motor car manufacturing is telling upon the nerves of the Napiers of to-day, or whether the mere existence of a new and difficult field for their enterprise suffices to arouse their primeval instincts, is again unknown, but their embarkation upon the business of aero engine manufacturers proves that those instincts persist.

Unfortunately, thanks to the manners and customs of Government departments, the Napier aero engine was not allowed to see the light of day till just too late for quantity production for war purposes, and thus its designers were deprived of the market which their efforts so thoroughly deserved.

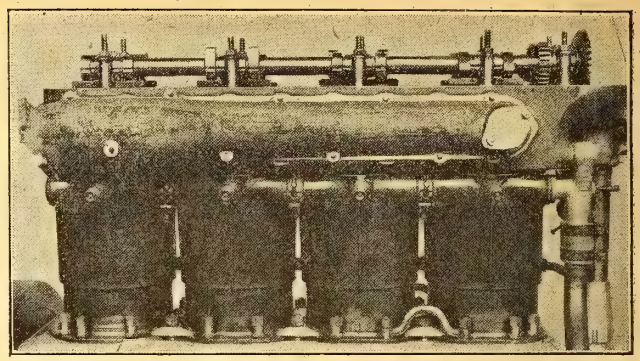
Despite this and the fact that they have had no other outlet for this particular product than the very limited one provided by the peace time state of aviation, the Napier Aero engine has established its reputation as an engine which may take as high a position in its particular branch of human effort as did the early Napier cars in theirs.

The Napier "Lion," as it is generally known, is by now fairly well known by sight and by name to those who are interested in such affairs. It is a 12-cylinder engine with its cylinders arranged in three rows of four, developing between 450 and 500 h.p. In appearance it is handsome, and its performances are in accord with its appearance. Its weight is low, it is compact—under 5 ft. long overall—its fuel and oil consumption show remarkable efficiency, and it has proved its reliability under the very searching test of daily commercial use between Paris and London, not to mention that it has already assisted at the setting up of 24 British air records.

Thus for anyone interested in aero engines the stand whereon this remarkable example of Napier enterprise will appear at Olympia will certainly provide a centre of great interest.



The Napier 450-h.p. twelve-cylinder aero engine.



One cylinder line of the Napier engine showing that, despite the complex appearance of the whole, the units composing it are simple.

Rolls-Royce, Ltd., London and Derby. For some long period during the war it was the habit of British pilots to admire the reliability of their opponents' aero engines and to lament the absence on their own side of any comparable English product.

It is not quite so generally known that for nearly as long a time it was the habit of German aero-engine experts to hold up to the engine makers of Germany the very high pitch of perfection to which Allied engine designers had brought their art.

It is perfectly true that the "expert" will often praise the design of an engine wherewith no pilot would willingly risk his life, but that the German experts were not altogether without reason is shown by the fact that the Allied engine for which they reserved their highest praise was also the engine which first gave to British pilots the sense that at last they had an engine which could compare with the German types in this matter of reliability, and which in addition allowed them to outfly and outclimb the enemy machines. It is needless to state that this engine was the Rolls-Royce.

It is of interest to remark that one of the special features of the Rolls-Royce engine—its epicyclic reduction gear—was of very particular value to our late opponents. They had long been seeking to avail themselves of the decreased weight per h.p. which could be attained by high-speed engines, but the difficulties of constructing a satisfactory reduction gear for long baffled them.

Captured samples of Rolls-Royce gears supplied a certain inspiration and the epicyclic reduction gear of the modern 12-cylinder Benz engines bears unmistakable sign of Rolls-Royce influence. The photographs here reproduced are from amongst those which were taken by German official agencies and circulated to German engine makers for information.

They accurately represent the Rolls-Royce gear of the war, and doubtless those in attendance at the Rolls-Royce stand at Olympia will be glad to inform the curious as to the important modifications which have since been made in this very important part of the engine.

But in any case, the Hawk, the Falcon, and the Eagle engines will inspire great interest on account of their war and post-war records, while the Condor which will there make its first public appearance will emphasise the wisdom which our late enemies displayed in sueing for peace when they did.

The Sunbeam Motor Car Co., Ltd. In 1899 the Sunbeam Motor Car Co., Ltd., was founded in Wolverhampton by the joint efforts of the Alderman John Marston, J.P., and Mr. T. Cureton, the present chairman of the company. They started work with the aid of three men, a boy, and a determination to make a success of the business, and in that year they produced a car, built throughout at their own and the allied works of John Marston, Ltd. This car ran—which was unusual amongst British-built cars of that date.

From that beginning progress came surely and not particularly slowly. In 1904 the firm produced to the designs of Mr. Pullinger, now the "P" of the B.H.P. aero engines, the four-cylinder T-head engined 12-14 h.p. Sunbeam car, which in the same year successfully ran from John o' Groats to Land's End. Next year a somewhat more powerful Sunbeam made a return trip over the same route without an engine stop.

In 1909 the firm secured the services of Mr. L. H. Coatalen as chief engineer, and immediately produced a 16-20 h.p. Sunbeam which scored many notable successes in competitions and hill climbs throughout the country. In 1912 Coatalen-designed Sunbeam cars scored an overwhelming triumph in the combined race for the Grand Prix and the Coupe de l'Auto. Three Sunbeams finished third, fourth and fifth in the open category of the Grand Prix, whereas no more than one of any other make finished, and for the Coupe de l'Auto

Beardmore

SAFETY FIRST
is now the order of the day

The days when B.H.P. was the only criterion, ended with the Armistice.

FOR RELIABILITY AND ECONOMY THE POST-WAR BEARDMORE is the aerial equivalent of the most reliable car engine.

This type is wanted to-day for successful Aero Transport, of Passengers, Goods or Mails.

Trick flying has never been a part of BEARDMORE'S repertoire. Solid performances in useful work have made the name famous.

Many of the largest manufacturers of Aircraft, among them the makers of the New "Aero Triplane," are standardizing with BEARDMORE ENGINES.

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Telephone : 238 *GERRARD.*
Works **Parkhead Steel Works, Glasgow.**

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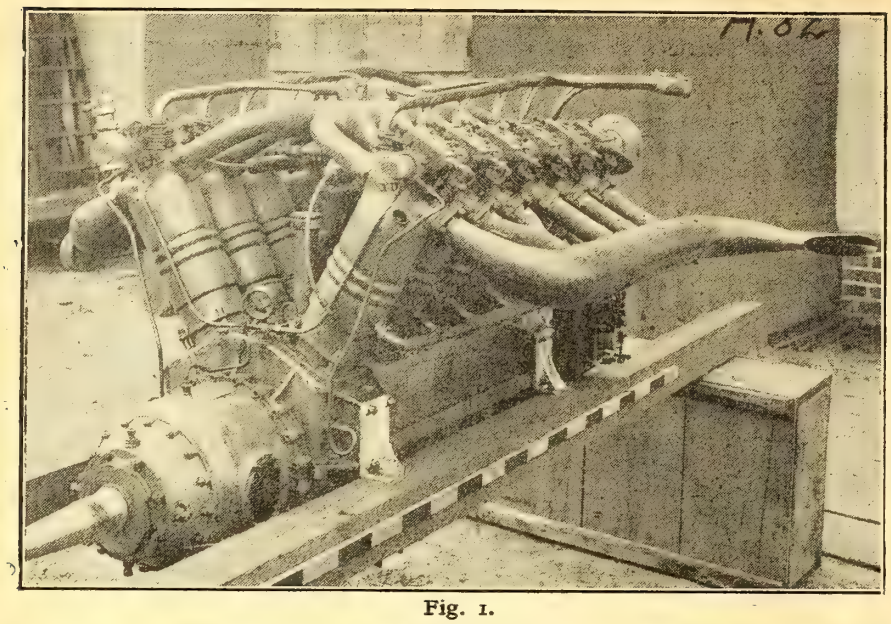

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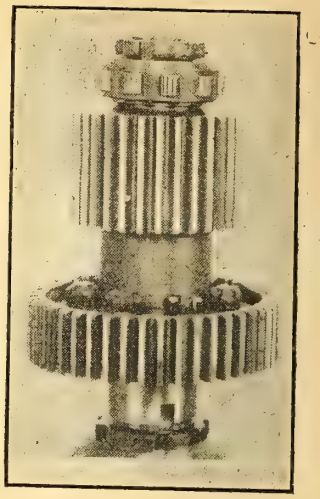

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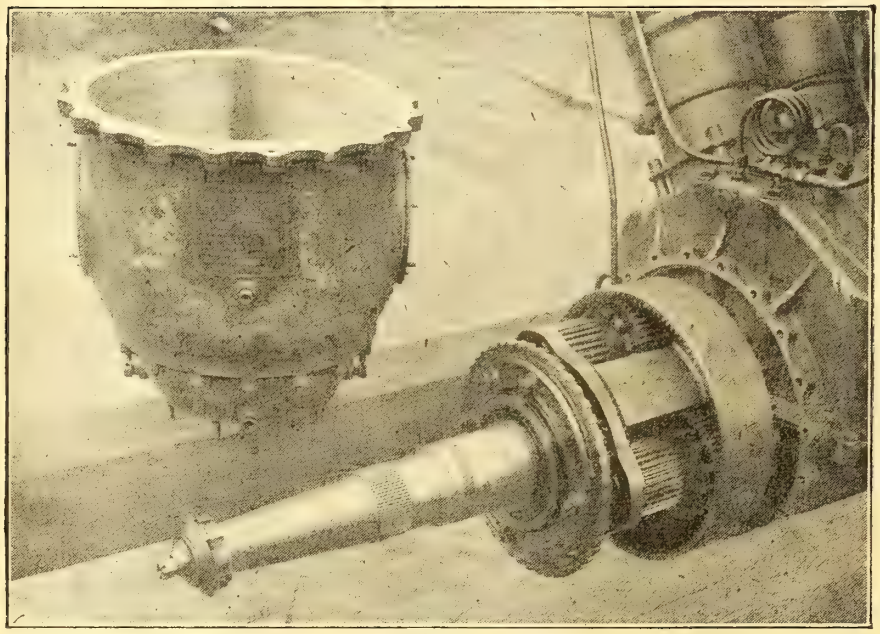

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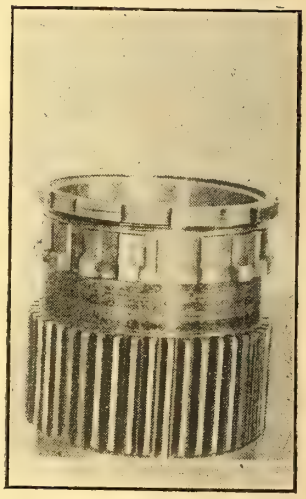
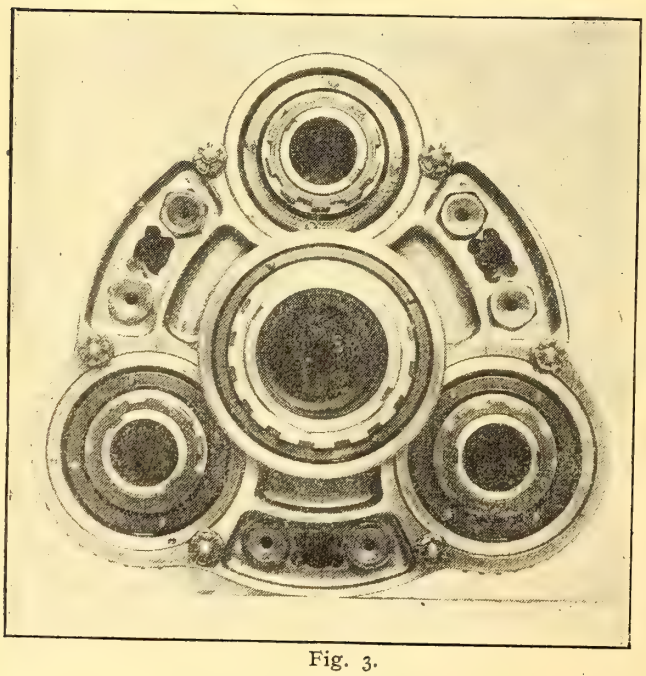


Fig. 5.

SOME ROLLS-ROYCE DETAILS.—The photographs reproduced on this page were among those taken at Adlersdof by the German equivalent of our Technical Department, and represent some details of the reduction gear of the Rolls-Royce "Eagle" engine. Fig. 1 shows the engine with the gearbox *in situ*. Fig. 2 is a view of the complete gear in position, but with the cover removed. Fig. 3 is a view from the crankshaft end of the airscrew shaft, showing one of the spiders carrying the planet wheels and the inner end of the airscrew shaft. Fig. 4 is the same unit in side elevation, showing the planet wheels and the ring carrying the airscrew front bearing. Figs. 5 and 6 show respectively the airscrew shaft pinion and a planet-wheel unit.



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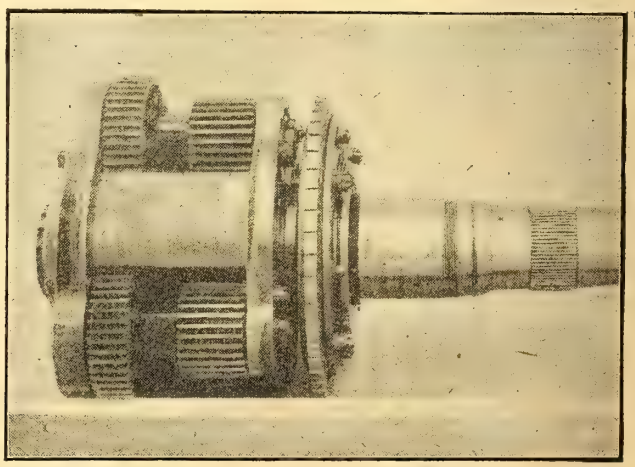
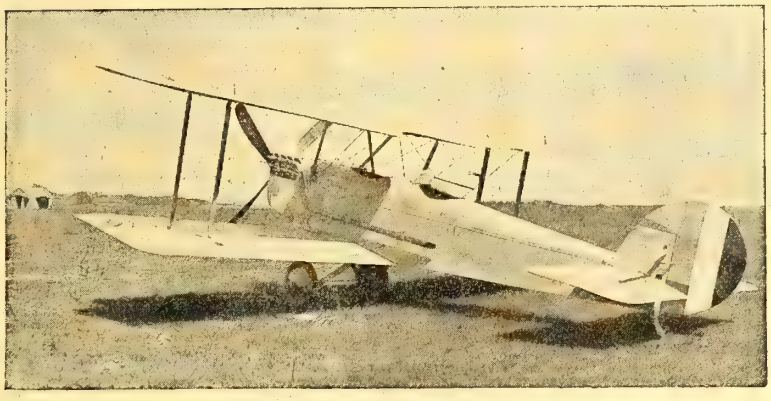


Fig. 4.



THE BOULTON & PAUL—P. 9.

An Aeroplane which is a Sound Commercial and Private Proposition

In this P. 9 Machine we have, we feel, solved the problem of providing an Aeroplane which is a sound business proposition—and which combines with low cost the great essentials for Commercial and Private use. All our great resources of material and craftsmanship have been utilised. Scientific Research and Experiment by a staff associated with flying from its beginnings coupled with the great Experience gained through the building of thousands of Aeroplanes during the War, have been concentrated in the production of this P. 9 Model.

It is a Two-Seater—Single Engine Tractor—which has attained on test a speed of over 100 miles per hour.

Its outstanding features are :—

CHEAP AND EASILY HOUSED. The Initial cost is extremely low ——— and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size it is easy to handle on the ground and requires but little accommodation. The principal dimensions are: Span, 27 ft. 6 in.; Length, 25 ft.; Height, 10 ft.

EASY TO FLY. The P. 9 has a big speed range, and low landing speeds, and this combined with Stability at all trimming speeds and well-balanced controls, allows the machine to be flown for long periods without undue fatigue. It also gives the maximum of Safety possible.

COMFORT AND CONVENIENCE. The comfort of the Pilot and Passenger has been specially considered. Each Cockpit is roomy and fitted with our special Seats. Controls for both Flying and Engine are fitted in the front and rear Cockpits to enable the machine to be flown from either position. The exhaust from engine is discharged behind the rear Cockpit giving a silencing effect and freedom from fumes. Two standard cases are provided for luggage and form part of the fairing immediately behind the rear Cockpit.

The uses to which this compact and efficient machine can be put are wide and various, and will suggest themselves to those who have been awaiting the stage of Aeronautical Development now reached by the P. 9. It can be used for dozens of Commercial Purposes. The same type carried photos from R. 34 direct to London. It has been sent to Australia for Sheep-runs—and will soon be in use in various parts of the world for Exploring Uncharted Territory, Examining Timber Tracts, Fighting Forest Fires, Carrying Mails to Distant Mines, Transition of Colonial Mails to Mail Steamers, and for General Patrolling and Police Purposes.

If you are interested—write for full particulars. State your needs or purpose, and our engineers will consider every detail closely—to advise soundly.

Boulton & Paul Ltd.
NORWICH

LONDON OFFICE ADDRESS: 135-137, QUEEN VICTORIA STREET, E.C.4.

the same cars were classed first, second and third. This performance effectively established the claim of Sunbeam cars to rank with the best products of the world, and nothing that has since occurred has modified that claim.

The firm which in 1899 staked its hopes on the future of automobilism lost nothing of its enterprise as a result of years of success, and with the coming of aviation the firm turned its attention to aircraft engines, and *circa* 1912 Mr. Coatalen had designed and built an experimental 150 h.p. 8-cylinder water-cooled aero engine, and installed it in a Maurice Farman biplane for practical tests in the air.

With the late Sir John Alcock as pilot-mechanic the engine was given most exhaustive trials, and thus it came about that when in August, 1914, war found Britain devoid of adequate manufacturing facilities for aircraft, it had at least the great Sunbeam car factory and a tested British aircraft engine design amongst its assets. The history of the work which was done by the early 150 h.p. and 225 h.p. Sunbeam engines is practically the history of the seaplane work of the R.N.A.S., and for that there is no space here.

Naturally enough Mr. Coatalen was not content with these early products, and throughout the war Sunbeam's continued to produce bigger and better engines, despite occasional setbacks inflicted by ignorant and incompetent engine experts in high places.

The demand for Sunbeams far exceeded at last the capacity of the Sunbeam works, and engines to their design were built in at least four other factories in this country, and in addition licences to build Sunbeam engines were granted to firms in America and in Switzerland.

Sunbeam engines were used not only by the British Air Forces, but by the Russian and the French Services. They have served in all climates from that of the north of Russia to those of Mesopotamia and the centre of Africa, and they everywhere gave good service.

Since the war they have crossed and recrossed the Atlantic in R.34, and as with the coming of commercial aviation it is safe to predict that Sunbeams will be found playing an ever increasing part in that illimitable field.

The Sunbeam exhibit at Olympia will show that the firm is even yet not content with the laurels it has gained, for it will exhibit the complete range of its present standard aero engine types, from the little 6-cylinder 100 h.p. Dyak to the great 800 h.p. Sikh.

The Zeitlin Engine Co., Outer Temple, 222, Strand, W.C.2. The aero-engine in its short, if eventful, history has shown signs of being nearly as liable to periodic changes of the nature of fashions as is woman's dress. Air-cooled engines and water-cooled engines, vertical engines and vee engines have all of them had their periods of favour and of neglect, but from the first appearance of the 50 Gnome till to-day, the rotary engine has shown itself steadily unmoved by the whims and fancies which dictate these varying phases.

From the beginning rotaries have been denounced as being fragile, delicate, and unreliable, as wasteful of fuel and of oil, as mechanically unsound and as gadgety, and yet throughout this period rotaries have steadily been built into aeroplanes for certain special purposes, and have there given results which no other type yet produced has quite succeeded in improving.

It is true that at the present moment the number of machines being built with such engines is comparatively small, and that there seems to be a general consensus of opinion that the present types of rotary, now that the war-time disregard for the cost of operation and of maintenance has vanished, cannot hope to survive much longer.

Nevertheless, the many splendid performances which stand to the credit of rotary engines—performances some of them possible with no other co-existent type—is evidence that they possess good qualities of their own, and that if the rotary prove that it can be developed to overcome some of its more patent commercial weaknesses it may yet survive for some long time.

It must be presumed that the Zeitlin Engine Co. believe that these weaknesses may be remedied, otherwise it would scarcely have chosen this as an opportune moment for developing and displaying a new engine of the type.

At Olympia there will be shown a Zeitlin 9-cylinder engine, designed to develop 220 h.p. at 12,000 ft. In external appearance the engine has at first glance the appearance of a conventional example of the type. The chief obvious difference is that, instead of the cylinders being set round the crankcase in one plane, they are staggered, each cylinder being at a different distance along the length of the crankcase.

Actually the engine is widely different in its interior economy and its special feature is that the stroke of each piston varies from stroke to stroke according to the particular function of that stroke. Thus in the 220 h.p. engine the suction stroke is 226 mm., the compression stroke 203.5 mm., the working stroke is 181 mm., and the exhaust stroke is 203.5 mm.

The excess length on the suction stroke is at the lower end of the piston travel, and results in the piston overshooting an induction port whereby a rich mixture is admitted to the cylinder. The compression stroke is normal, and the working stroke is shortened so that the piston does not uncover the inlet port. The exhaust stroke is lengthened upwards and the piston reaches practically to the cylinder head, thus very completely clearing out all the exhaust products. This will suffice to show that the engine has the merit of at least novelty, and it should attract all those interested in aero-engine design. That the engines are being built at the works of W. H. Allen, of Bedford, should secure that they are excellent specimens of the engine-builder's craft.

MORE ACCESSORIES AT OLYMPIA.

Since the publication of the previous issue of THE AEROPLANE the exhibitors dealt with in the following notes have signified that they are exhibiting and have indicated the nature of their exhibits.

THE AVIATION ASSURANCE ASSOCIATION, 1, Royal Exchange Avenue, E.C.3.

The Aviation Assurance Association is a body which was formed by certain of the most enterprising and courageous members of the insurance business for the special purpose of attending to the new branch of that business which the development of aerial travel was bound to bring into existence. The policies dealt with by the concern are issued by the underwriting members of Lloyds, The Eagle, Star and British Dominions Insurance Co., Ltd., and the Excess Insurance Co., Ltd., for whom the Association acts as agents, and their business is under the management of Mr. H. Barber, well known to all who have followed the history of aviation for his early work as an experimental aeroplane designer.

Thus the Association is obviously in the front rank as an insurance concern, and has a practical knowledge of the special conditions which pertain to aviation which could scarcely be bettered.

At their stand at Olympia full particulars as to the aerial policies which they are prepared to issue will naturally be available, but even to those who have little to insure and nothing wherewith to insure it, certain of their historical exhibits will be of interest. Amongst them is the first policy issued to cover an Aerial Trans-Atlantic cargo risk. This was effected on a consignment of platinum, shipped per H.M.A. "R.34" from America to England.

THE BRITISH EMAILLITE CO., LTD., 5, Hythe Road, Willesden, N.W.

Generally as a dope of the first quality Emaillite requires little introduction to the readers of this journal. Nevertheless, it seems generally to be imagined by those who are not directly concerned with the manufacture and use of dope, that Emaillite is just Emaillite, and that there it ends. The British Emaillite stand may serve to enlighten such, for they will there discover that there are special dopes and special methods of using that dope according to the result that it is desired to attain. For instance, a machine to be used for tropical services will be doped—if those who dope it know their business—according to Emaillite Scheme X—while standard type machines to be used under less trying conditions may with economy use Scheme B.

Moreover, for school machines, where the chances of a dope surviving for the term of its natural life is small, an even cheaper but reliable scheme has been provided.

Then there are dopes and doping schemes for airships. Emaillite protective varnishes for aircraft, pigmented dopes of many colours, varnishes, wood fillers, paints, and the like mysterious compounds.

Further and beyond these the Emaillite will exhibit the airscrews, components, and aeronautical instruments which are so well known under the initials G.A.C.

THE GAS ACCUMULATOR CO. (U.K.), LTD., Beacon Works, Brentford.

The problem of providing signalling and landing lights for aircraft flying at night was first considered in the quite early days of flying, and the first aerial signal light of the Gas Accumulator Co.'s type (generally called the A.G.A. type) was produced in 1913. This was a portable type designed for military operations, and was considered by the military authorities to fulfil all their requirements.

War, however, showed that it possessed serious drawbacks, as although it served its primary purpose of aiding friendly pilots it also served to guide enemy ones, and for that reason the searchlight type, whose beam is confined to a limited arc, and which is invisible outside that arc, supplanted the type giving an all-round illumination. This type, however, visible and recognisable by a pilot approaching from any direction, is

AERO EXHIBITION, OLYMPIA, July 9–20.

STAND No. 8.

MARCONI WIRELESS TELEGRAPH CO., LTD.,
MARCONI HOUSE, STRAND, LONDON, W.C.2.

BEG to announce that amongst their exhibits there will be on view AIRCRAFT SETS, PORTABLE GROUND STATIONS, and a 1½ K.W. COMBINED TELEPHONE and CONTINUOUS WAVE :: :: TELEGRAPH CABINET. :: ::

A Handley Page machine fitted with a Marconi Aircraft :: :: Set will be on view at STAND 49. :: ::

Blackburn AIRCRAFT

The 450 h.p. BLACKBURN "SWIFT"

Fitted with NAPIER LION ENGINE,

is the latest type of high performance
Torpedo-carrying Ship Aeroplane.

The BLACKBURN AEROPLANE & MOTOR Co., Ltd.

SPECIALISTS IN TORPEDO AIRCRAFT,

invite you to inspect it at

STAND No. 64, The Aero Exhibition.

FOR SPECIFICATION, APPLY TO:

THE STAND or OLYMPIA, LEEDS. or 33, NORFOLK ST., W.C.2.

Tel.—Propellers, Leeds. 'Phone—Roundhay 601, 'Phone—Central 984.

what is required for peaceful navigation purposes, and it is this type which the Gas Accumulator Co. are now advocating for that purpose.

The aerial light erected at Hounslow and since removed to Croydon, was an "A.G.A." light, and it has shown itself to be extremely satisfactory, and absolutely reliable, and is a typical example of their products of this class.

Briefly, it is an entirely automatic and self-contained apparatus. The source of light is dissolved acetylene, stored in portable steel cylinders. The gas itself in its passage from the cylinder to the burner provides the motive power to drive the rotating lantern, and the light is controlled by a sun valve, which automatically lights and extinguishes the Beacon at dark or dawn. Thus there is no accessory power or gas producing plant, the light requires no attention whatever, and it is possible to store enough gas to light and work the apparatus for one year and to leave it to itself for that period.

J. Owen and Sons, Ltd., 199a, Borough High Street, S.E.1.

As early as 1911 the writer has recollections of assisting at the construction of an aeroplane almost entirely built from Joseph Owen's timber.

That timber was excellent throughout—certainly better than the aeroplane eventually proved to be. Since that date, and probably before it, Owens have supplied aircraft timber which has been put to better uses and the quality which then distinguished their wares has always retained its high level. Joseph Owen and Sons will show at Olympia timbers of all the kinds in demand for aircraft construction, and it may be taken for granted that these timbers will be of the highest grade.

Pettit's Patent Safety Filler Co., Ltd.

To all those who use petrol, be it on the road or in the air, the present price of that commodity makes it a matter of some importance that little or none of it be wasted. But with petrol can and petrol tanks as they usually are, the transference of that mobile fluid from the one container to the other generally involves an appreciable waste. Pettit's Patent Safety Filler has been designed to stop such a loss of petrol, and apparently successfully designed. It will very rightly appear on the firm's stand at Olympia, together with other ingenious devices bearing upon the use of petrol.

Samuel Bros., Ltd., 65 and 67, Ludgate Hill, E.C.4.

Though flying can be the most comfortable method of travelling yet devised, it can, if one be insufficiently clothed, be one of the most discomfortable imaginable. Therefore all those whom Olympia decides to take to the airways of the world should, before they put their decisions into practise, consider the question of proper clothing. For those who merely propose to book passage to Paris in lordly limousines the matter is unimportant, but he who would face the clean winds of heaven and discover the true joys of flying may find a visit to Samuel Bros.' stand a source of fruitful inspiration, for there will be flying clothing, both of leather and of the well-known Omne Tempus weatherproof cloth, overalls, helmets, nice woolly gloves (incidentally not devoid of use to those who shrink from the perils of the air), and many other comforts for the chilly.

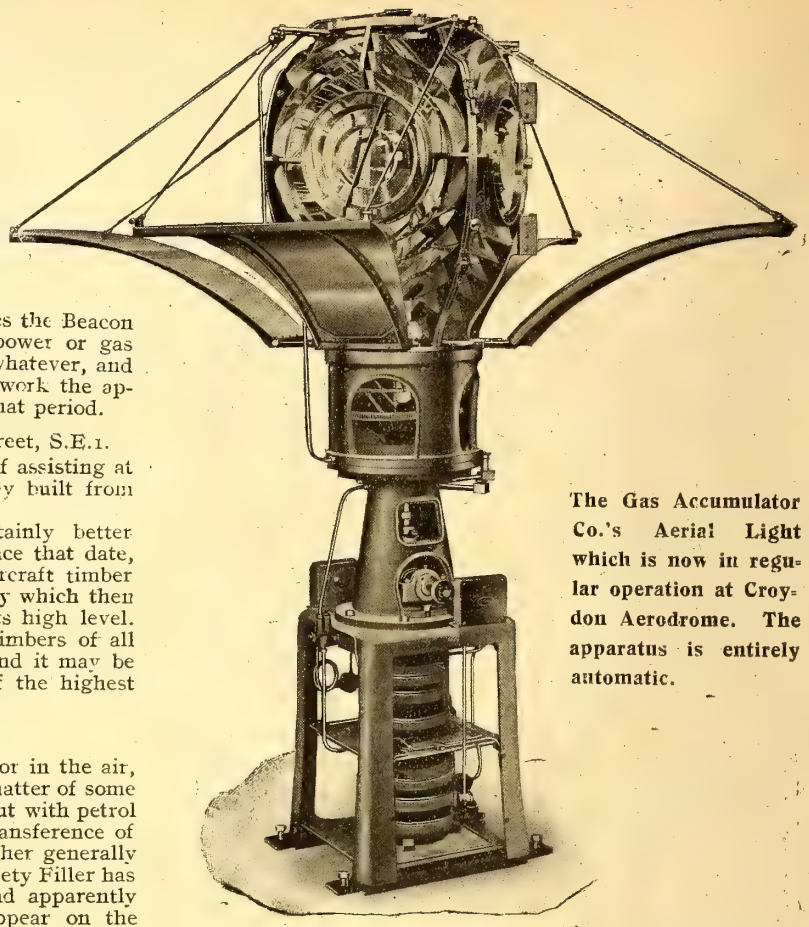
John Thompson Motor Pressings, Ltd., Wolverhampton.

Those who would build aeroplanes in pre-war days had to face the manufacture of engine cowls, engine plates, and metal fittings with the tools and equipment of the journeyman tinsmith or thereabouts. To-day the path of the constructor is made easy for him, and even those whose main business is that of mass producing motor cars will deign to assist him in such matters. The firm now in question are equipped for such work, and they will exhibit at the Aero Show samples of their craft in pressed metal work for aeroplanes.

A VALUABLE BOOK OF REFERENCE.

"The Aerial Year Book and Who's Who in the Air" stands by itself amongst the many popular works dealing with aviation. It is a dictionary, a directory of the Aircraft Industry, and a very complete reference book on the present state of international aviation. The articles contained therein are written by those who know whereof they write and its information is remarkably accurate.

It should be in the hands of all those who take an interest in aerial matters—whether that interest be commercial, military or technical—and for the convenience of all those in whom such an interest is roused by a visit to the Aero Show, the Cross-Atlantic Newspaper Service, Ltd., who publish the work, have taken a stand there, where it may be consulted and presumably purchased.



The Gas Accumulator Co.'s Aerial Light which is now in regular operation at Croydon Aerodrome. The apparatus is entirely automatic.

AN INTERESTING BOOKLET.

As a souvenir of the Show, The Palmer Tyre, Ltd., are reproducing a most interesting little booklet entitled "A Record of Success." It has numerous water colour drawings by Mr. Geoffrey Watson, the originals of which will be displayed on the Palmer Stand. It also contains much technical information on rims, hubs, bushes, and wheel shields, a diagram showing aeroplane output during the war, reproductions of letters from prominent aeroplane manufacturers, War Office telegrams dealing with the speeding up of production, and many other items of an informative and interesting nature. This exceedingly interesting and historical record will be obtainable at the Palmer Stand free.—G. D.

THE AIRSHIP QUESTION.

Sir,—I notice in the recent article on the Air Estimates by W. E. de B. an attack on Airships.

The writer states that "Airships especially in Great Britain are not efficient weapons of war," which is an insult to the Airship Service and a downright falsehood, for as a matter of hard fact the Naval airships performed invaluable work, in their convoying, submarine scouting, mine spotting, Grand Fleet patrols and reconnaissances. Moreover, this work could not have been performed nearly so efficiently by heavier-than-air machines.

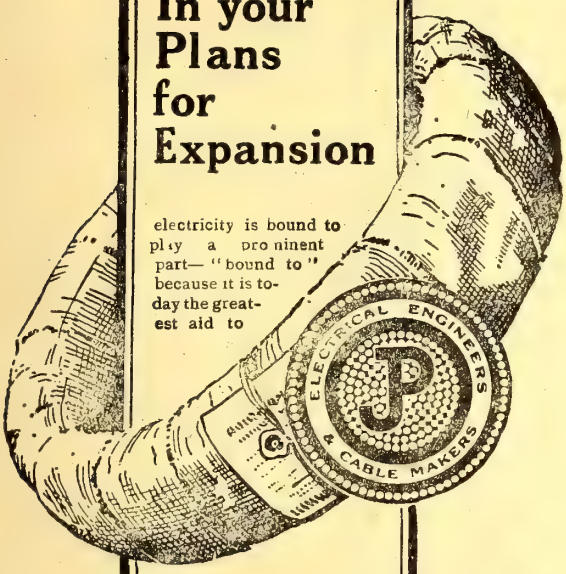
At this time when Airship companies are being formed in France, America, Germany and elsewhere, and when a British combine is hoping to get to work soon, it is up to all aeronautical papers to try and be fair to airships, and to remember that when they attack lighter-than-air craft in this way they are, besides showing their own ignorance of such matters, doing a great national disservice.

There seems to be an idea abroad that airships have no future War value, and no greater or more dangerous mistake could be made than believing this, as one day we will find out, to our cost. The Aeroplane helped on Kite Balloons, now let it help Airships.

(Signed) A. F. de Moleyns.

[The Aeroplane does its best to help all forms of aircraft so far as its limited space will allow. W. E. de B. W.'s remark was not an attack on airships, it was merely a statement of fact. Perhaps he will be so good as to reply to Mr. de Moleyns.—Ed.]

In your Plans for Expansion



electricity is bound to play a prominent part— "bound to" because it is today the greatest aid to "speeding-up" known in the Manufacturing World.

That fact you cannot ignore, neither the other that such plans must be considered well in front.

Demand — phenomenal demand for all kinds of Electrical Equipment—renders that imperative.

In our own case this applies, and, speaking generally, we can only talk "long date" deliveries.

As to immediate needs we will do everything which lies within our power, and in the supply of

V.I.R. Cables

(of which we carry constantly large floating stocks at Works and Branches), we can aid materially—in fact in nearly every case can deliver on the following day to that on which your order is received.

We ask for your enquiries and place our 45 years' experience at your disposal.

Johnson & Phillips LTD.

Electrical Engineers and Cable Makers since '75.

Charlton, London, S.E.7.

City Office: 12, Union Court, Old Broad Street, E.C.2.

AERO EXHIBITION,

July 9th to 20th,

OLYMPIA, LONDON, W.

THE PIONEER MANUFACTURERS OF SPECIAL STEELS FOR AIRCRAFT CONSTRUCTION

are showing

Air and Oil-hardening Nickel Chrome Steels,

Chrome Vanadium,

Nickel and High Tensile Carbon Steels,

Case-hardening Steels,

STAINLESS STEEL,

Steel Bars and Sheets,

Forgings, Stampings, Pressings, Crankshafts, Valves, Connecting Rods, and other Forged and Stamped Engine Parts.

Pressed Steel Cylinders and Cylinder Liners,

"SPEEDICUT" High Speed Steels,

Special Crucible Carbon Tool Steels for all purposes,

Files, Rasps, Hacksaw Blades, Saws, Etc., Etc.

on

STAND 40.

THOS. FIRTH & SONS, LTD.
SHEFFIELD.

ROLLS-ROYCE

THE FIRST AND ONLY AERO ENGINES

1. To make a direct aeroplane flight across the Atlantic. (Vickers-Rolls 'Plane)

2. To fly from England to Australia. (Vickers-Rolls 'Plane)

3. To fly from England to South Africa. (Vickers-Rolls 'Plane)

In a recent interview, Lieut. Col. Sir Hesperus A. Van Ryneveld, K.B.E., D.S.O., M.C., who piloted the Vickers-Rolls 'plane to South Africa, said :-

"The involuntary descent at Buluwayo was in no way due to engine trouble; on the contrary the ROLLS-ROYCE engines were running as smoothly as ever."

THE WORLD'S BEST AERO ENGINES

ROLLS-ROYCE, LIMITED, 15, Conduit Street, LONDON, W.1.
Telegrams: "Rolhead, Reg. London." Telephone: Gerrard 1654 (3 lines.)

We are exhibiting ROLLS-ROYCE AERO ENGINES at the International Aero Exhibition, Olympia, July 9th—20th, 1920. Stand No. 53. ROLLS-ROYCE AERO ENGINES will also be exhibited on the stands of Messrs. VICKERS, LTD., and Messrs. H. M. HOBSON, LTD.

OFFICIAL NOTICES.

AIR MAIL SERVICE BETWEEN ENGLAND AND HOLLAND.

The Postmaster-General announces that, beginning on Monday, July 5th, there will be a daily dispatch of mails by aeroplane (Sundays excepted) between London and Amsterdam, leaving the respective aerodromes at about 4 p.m., and arriving at the respective terminal Post Offices at about 7.30 p.m.

The air mail fee has been fixed at the low rate of 3*d. per oz.;* and unrestricted facilities for posting will be afforded. (The special arrangements relating to letters for the London-Paris air mail service remain in force for the present. An early and substantial reduction of the fee for the Paris service is in contemplation.)

Express air mail packets for Amsterdam and Rotterdam should normally be delivered the same evening, and non-express air mail packets for these places and for the rest of Holland by first post on the following morning. As letters sent by the ordinary night mail from London are not delivered anywhere in Holland until the following afternoon or evening, the air mail will normally be quicker by, at any rate, the greater part of a business day; and by the use of the air mail in both directions it will be possible for a business house in the City or West End of London to obtain a reply from Amsterdam within about thirty hours.

Air mail letters from Holland will normally be delivered in many of the large provincial towns by first post on the morning after dispatch from Amsterdam.

Every class of correspondence, registered and unregistered, except parcels and insured packets, may be sent. Packets will be accepted for ordinary as well as for express delivery. They may be posted, if intended for registration, at any Post Office, or, if unregistered, in any public posting box.

Every air mail packet must be *prominently marked* in the top left-hand corner of the cover with the words "AIR MAIL," or, if express delivery is desired, "AIR MAIL, EXPRESS."

The fees shown below must be prepaid by means of postage stamps affixed to the cover in the ordinary way:—

(1) Ordinary foreign postage, and registration fee (where payable); (2) an air mail fee of 3d. *per oz.;* (3) an express fee of 6d. *per packet* when express delivery is required.

The latest times of posting will be as follows:—

In the Provinces up to the latest time of posting for transmission by the last night mail to London; but in some cases connection by day mail to London will be obtainable. Precise information can be obtained from the local Head Post Office.

IN LONDON.

Office or District	Registered (if handed in).	Registered (if handed in).	Unregistered (if posted in Public Letter Boxes).
General Post Office	2.55 p.m.	3.0 p.m.	1.30 p.m.
Threadneedle Street, B.O.	2.40 p.m.	2.45 p.m.	E.C. District — 12 noon at larger Branch Offices, 11.45 a.m. elsewhere.
Lombard Street, B.O.	2.40 p.m.	2.45 p.m.	
Parliament Street, B.O.	2.40 p.m.	2.45 p.m.	11.0 a.m.
Charing Cross, B.O.	2.45 p.m.	2.50 p.m.	10.30 a.m.
W.C.D.O.	3.5 p.m.	3.10 p.m.	12 noon.
W.D.O.	3.10 p.m.	3.15 p.m.	12 noon.
S.W.D.O.	2.35 p.m.	2.40 p.m.	12 noon.
Rest of London—			
District Head Offices	—	—	about 12 noon (except Paddington, 11.30 a.m.).
Sub-Districts	—	—	about 8.30 a.m.

NOTICE TO AIRMEN, No. 75.

AIR MINISTRY, June 30th.

It is hereby notified that:—

The landing lights at Bordeaux Aerodrome as described in Notice to Airmen No. 28 of March 24th, 1920, are only exhibited when aircraft are expected.

Pilots intending to land at Bordeaux at night should therefore communicate direct with the Commandant, whose telegraphic address is: Commandant, Aero Merignac, Bordeaux.

It is not necessary to advise the Commander beforehand when landing in the day.

Attention as drawn to Notice to Airmen No. 66 of June 7th, 1920, under which all aeroplanes entering France from England must first land at either St. Inglevert or Le Bourget Aerodrome.

* N.B.—Notice to Airmen No. 69 of June 18th is hereby cancelled.

NOTICE TO AIRMEN, No. 76.

AIR MINISTRY, July 2nd.

The following information is hereby notified:—

A.—ALTERATION IN NIGHT SIGNALS.

Valenciennes—An occulting lighthouse giving a *white* light, which has been established at the N.E. angle of the ground (2 km. south of the town), is in operation every day from June 1st from one hour after sunset.

The characteristic signal is — V — three short flashes and one long flash (10 sec.).

Light, 0.5 sec.; occultation, 0.5 sec.; light, 0.5 sec.; occultation, 0.5 sec.; light, 0.5 sec.; occultation, 0.5 sec.; light, 3.0 sec.; occultation, 4.0 sec.

B.—DAY SIGNALS.

Le Bourget.—An arrow giving the direction for landing has been placed at the angle formed by the line of the hangars and the offices of the aerodrome.

A white wind-sleeve has been placed on the second hangar to the south of the offices of the aerodrome.

St. Inglevert.—A landing arrow 10 metres long has been placed at the south angle of the ground; landing must be carried out in the direction of the arrow.

C.—TELEPHONIC CONNECTION.

Nimes.—The telephone number of the principal air station of Nimes is: Nimes 693.

Telephone Priority.—The following telephone stations have priority for urgent communications with respect to the safety of air navigation:—

Stations in Connection.	Telephone Exchanges
Abbeville with (Le Bourget *via* (St. Inglevert ,,	Abbeville—Paris Nord. Calais.
La Heve (meteorological) with military W/T Kleber Barracks ,,	Le Havre.
Pujaut (principal air station) with Nimes (principal air station) ,,	Avignon—Nimes.

D.—RADIO-TELEPHONY AND RADIO-TELEGRAPHY.

Maubeuge.—A wireless station has been in operation since May 22nd. It ensures temporarily a special service with a wave length of 1,200 metres, and will later be incorporated in the Paris-London system with 1,400 metres wave length.

The call sign is A.V.

Warning with regard to Squalls.—Commencing from May 25th the warnings of squalls previously sent by 1,850 metre wave lengths are emitted by 1,400 metres wave lengths.

The stations issuing the warnings are:—

Le Bourget, Z.M.	Amiens, Y.B.
Strasburg, C.3.	Tours, Y.G.
Bourges, Y.E.	Toulouse, Y.F.

Authority: French Notice to Airmen, No. 8.

NOTICE TO AIRMEN, No. 77

AIR MINISTRY, July 3rd.

It is hereby notified that:—

The Dutch Minister of Ways and Communications has determined that the air space above the Doorn area, which is delineated as follows:—

Line: Driebergen Station-Culemborg Railway Bridge; Lek and Neder-Rijn from Culemborg Railway Bridge to the ferry at Amerongen;

Line: ferry at Amerongen to the crossing-point of the railway lines Rhenen-Amersfoort and Arnhem-Utrecht; railway line between the said crossing-point and Driebergen Station,

must be avoided by aircraft other than Netherland military aircraft.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Carg lbs. M=Mail.	No. of Passengers.	Pilot.
June 28th	A.T. & T.	DH16	G-EALU	London	Paris	09 30	—	Mail	4	Robbins
	A.T. & T.	DH9	G-EAGX	London	Paris	09.40	12.14	Nil	Nil	Holmes
	A.T. & T.	DH16	G-EALM	London	Amsterdam	09.35	12.30	Goods	Nil	Game
	H.P. & M.A.	H.P.	G-EATG	London	Brussels	12.45	15.10	Nil	8	Jones
	H.P. & M.A.	Breguet	F-CMAD	London	Paris	12.52	15 30	Goods	2	Patin

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs M = Mail.	No of Passengers.	Pilot.
June 28th	A.T. & T.	DH16	G-EAQS	London	Paris	14.08	15.55	Nil	Nil	Shepperson
	A.T. & T.	DH16	G-EASW	Paris	London	09.40	14.57	Nil	4	Armstrong
	A.T. & T.	DH9	G-EAQP	Paris	London	09.50	12.42	Nil	2	Shepperson
	A.T. & T.	DH16	G-EAPM	Paris	London	10.00	12.45	Nil	4	McMullin
	C. des G.E.A.	Goliath	F-GEAB	Paris	London	11.00	15.20	Goods	Nil	Favrant
	A.T. & T.	DH9	G-EAOZ	Paris	London	11.50	14.25	Nil	2	Forson
	A.T. & T.	DH9	G-EAGX	Paris	London	12.55	15.45	Nil	2	Holmes
	C.T.	Nieuport	F-CGTY	Paris	London	12 25	15.16	Mail	Nil	Lasne
	A.T. & T.	DH16	G-EALM	Amsterdam	London	14.55	18.35	Goods	3	Game
	A.T. & T.	DH16	G-EALU	Paris	London	16.10	18.35	Nil	2	Robbins
	A.T. & T.	DH16	G-EAQS	Paris	London	17.10	19.20	Nil	2	Shepperson
June 29th	A.T. & T.	DH16	G-EALM	London	Amsterdam	10.47	15.20	Goods	Nil	Game
	A.T. & T.	DH16	G-EALU	London	St. Inglevert	10.49	—	Nil	4	Robbins
	A.T. & T.	DH9	G-EAPL	London	Paris	10.53	15.25	Gd's&M	Nil	Forson
	A.T. & T.	DH16	G-EASW	London	Paris	10.54	16.00	Nil	4	Armstrong
	C.T.	Nieuport	F-CGTY	London	Paris	14 50	17.45	Nil	Nil	Lasne
	A.T. & T.	DH9	G-EAGY	London	Paris	16.25	19.05	Goods	Nil	Bamber
	A.T. & T.	DH16	G-EAPM	London	Paris	16.40	19.05	Gds.&M	2	Lawford
	H.P. & M.A.	Breguet	F-CMAC	Paris	London	13.17	15.50	Goods	2	Challaux
	H.P. & M.A.	Breguet	F-CMAF	Paris	London	13.30	15.49	Goods	2	Martel
	A.T. & T.	DH16	G-EALU	St.Inglevert	London	—	15.53	Nil	4	Robbins
	A.T. & T.	DH16	G-EASW	Paris	London	16.55	19.45	Nil	4	Armstrong
	A.T. & T.	DH9	G.EAQI	Paris	London	16.40	19.00	Nil	2	Bradley
	H.P. & M.A.	Spad	F-CMAY	Paris	London	16.45	19.15	Mail	1	Bizot
	A.T. & T.	DH16	G-EALM	Amsterdam	London	16.32	19.20	Goods	3	Game
	A.T. & T.	DH9	G-EAPL	Paris	London	17.10	19 55	Goods	Nil	Forson
June 30th	A.T. & T.	DH16	G-EALU	London	Paris	09.35	11.55	Nil	4	McMullin
	A.T. & T.	DH9	G-EAQL	London	Paris	09.45	12.15	Gd's&M	1	Holmes
	A.T. & T.	DH16	G-EALM	London	Amsterdam	10.00	12.35	Goods	Nil	Game
	I.A.L.	DH4	G-EAMU	London	Paris	10.10	12.25	Goods	Nil	Chattaway
	H.P. & M.A.	Breguet	F-CMAC	London	Paris	12.10	—	Goods	Nil	Challaux
	C. des G.E.A.	Goliath	F-GEAB	London	Paris	10.25	13.54	Goods	Nil	Favrant
	H.P. & M.A.	Breguet	F-CMAF	London	Paris	12.11	14.45	Nil	1	Martel
	H.P. & M.A.	Spad	F-CMAY	London	Paris	14.10	—	Nil	Nil	Bizot
	A.T. & T.	DH16	G-EASW	London	Paris	16 00	18.21	Nil	3	Robbins
	A.T. & T.	DH16	G-EAPM	London	Paris	16.38	19.35	Nil	2	Armstrong
	A.T. & T.	DH9	G-EAGY	Paris	London	12.00	14 50	Nil	2	Bamber
	A.T. & T.	DH16	G-EAPM	Paris	London	09.40	12.50	Nil	4	Lawford
	C.T.	Nieuport	F-CGTO	Paris	London	12.50	15 10	Mail	Nil	Le Comte
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15 03	19.08	Goods	Nil	Game
	A.T. & T.	DH16	G-EALU	Paris	London	17.00	19 15	Nil	4	McMullin
	I.A.L.	DH4	G-EAMU	Paris	London	17.45	19.55	Goods	1	Chattaway
	A.T. & T.	DH9	G-EAQL	Paris	London	18 20	20.55	Nil	2	Holmes
July 1st	A.T. & T.	DH9	G-EAPL	London	Paris	09.40	13.45	Goods	1	Forson
	A.T. & T.	DH16	G-EALM	London	Amsterdam	10 03	12.40	Goods	Nil	Holmes
	A.T. & T.	DH16	G-EALU	London	Paris	15.45	19 50	Mail	4	Lawford
	A.T. & T.	DH9	G-EAQN	London	Paris	16.33	20.00	Gd's&M	Nil	Bamber
	A.T. & T.	DH16	G-EASW	London	Paris	16.48	19.30	Nil	4	McMullin
	C.T.	Nieuport	F-CGTO	London	Paris	17.40	—	Nil	Nil	Le Comte
	A.T. & T.	DH16	G-EASW	Paris	London	11.20	13.35	Nil	4	Robbins
	C. des G.E.A.	Goliath	F-GEAB	Paris	London	12 00	15.26	Goods	6	Labouchère
	H.P. & M.A	Breguet	F-CMAD	Paris	London	13.00	15.18	Gd's&M	Nil	Le Men
	A.T. & T.	DH16	G-EAPM	Paris	London	14.05	16.25	Goods	1	Armstrong
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.00	17 55	Goods	2	Holmes
	A.T. & T.	DH9	G EAPL	Paris	London	16 40	18.55	Nil	2	Forson
July 2nd	A.T. & T.	DH16	G-EAPM	London	Paris	09.55	12.40	Mail	4	Robbins
	A.T. & T.	DH9	G-EAPL	London	Paris	09.57	12.40	Goods	Nil	Armstrong
	A.T. & T.	DH16	G-EALM	London	Amsterdam	11 35	14 15	Goods	Nil	Game
	H.P. & M.A.	Breguet	F-CMAD	London	Paris	12.21	15.45	Goods	Nil	Le Men
	A.T. & T.	DH9	G-EAGY	London	Paris	12.50	15.20	Nil	2	Holmes
	C.T.	Nieuport	F-CGTI	London	Paris	17.05	20.45	Nil	Nil	Lasne
	A.T. & T.	DH9	G-EAQN	London	Paris	17.30	20.00	Nil	2	Forson
	A.T. & T.	DH16	G-EASW	Paris	London	10.05	12.10	Nil	2	McMullin
	A.T. & T.	DH9	G-EAQN	Paris	London	10.05	12 35	Nil	2	Lawford
	C.T.	Nieuport	F-CGTI	Paris	London	12 30	14.53	Mail	Nil	Lasne
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.18	17.57	Goods	3	Game
	A.T. & T.	DH16	G-EALU	Paris	London	17.15	19.30	Goods	1	Robbins
	A.T. & T.	DH9	G-EAPL	Paris	London	17 15	19.30	Nil	1	St. Barbe
July 3rd	A.T. & T.	DH16	G-EALU	London	Paris	09.34	11.55	Nil	4	Robbins
	A.T. & T.	DH9	G-EAQL	London	Paris	09 42	14.00	Gd's&M	Nil	Bradley
	A.T. & T	DH16	G-EALM	London	Amsterdam	10.00	12.47	Goods	1	Game
	C des G.E.A.	Goliath	F-GEAB	London	Paris	11 50	15.50	Goods	2	Labouchère
	A.T. & T.	DH16	G-EAPM	London	Paris	17.20	19.35	Mail	4	McMullin
	A.T. & T.	DH9	G-EAPL	London	St. Inglevert	18.08	—	Nil	Nil	Armstrong
	A.T. & T.	DH16	G-EAPM	Paris	London	10.00	12.10	Nil	2	Armstrong
	H P & M A.	Salmson	F-CMAE	Paris	London	13.10	15 38	Goods	Nil	Challaux
	H.P. & M.A.	Breguet	F-CMAB	Paris	London	13.10	15 35	Nil	2	Martel
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.00	17.10	Goods	1	Game
	A.T. & T.	DH9	G-EAQL	Paris	London	16.50	18.55	Nil	2	Holmes
	A.T & T.	DH9	G-EAQN	Paris	London	16.55	18.55	Nil	2	Forson
	A.T. & T.	DH16	G-EALU	Paris	London	17.10	19.10	Goods	Nil	Robbins
	A.T. & T.	DH9	G EAPL	St. Inglevert	London	—	20.25	Nil	Nil	Armstrong
July 4th	H.P & M.A.	Breguet	F-CMAB	London	Paris	10.05	12 55	Nil	3	Martel
	A.T. & T.	DH16	G-EALM	London	Paris	10 00	12 25	Nil	4	Game
	A.T. & T.	DH9	G-EAQN	London	Paris	11.10	13.45	Nil	2	Forson
	A T & T.	DH9	G-EAGY	London	Paris	10.15	12.53	Nil	2	Bamber
	A.T. & T.	DH16	G-EALU	London	Paris	11.30	13.55	Nil	4	Armstrong
	A.T. & T.	DH16	G-EAPM	Paris	London	10 37	13 00	Nil	4	McMullin
	A.T. & T.	DH16	G-EALM	Paris	London	—	16.50	Nil	Nil	Game

The Air Port of Cricklewood.

Date. 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M = Mail.	No. of Passen-gers.	Pilot
June 28th	H.P. & M.A.	DH9	G-EATA	London	Paris	12.10	14.45	2	2	Foot
	H.P. & M.A.	Hand'y Page	G-EATJ	Paris	London	12.30	16.45	270	9	Helliwell
	H.P. & M.A.	Hand'y Page	G-EASZ	Paris	London	15.00	18.30	274	1	Wilcoxson
June 29th	H.P. & M.A.	Hand'y Page	G-EASZ	London	Paris	12.00	15.55	176	5	Olley
	H.P. & M.A	DH9	G-EATA	Paris	London	12.15	14.45	50	2	Foot
	H.P. & M.A.	Hand'y Page	G-EATG	Brussels	London	12.00	16 10	124	3	Jones
	H.P. & M.A.	Hand'y Page	G-EASZ	Paris	London	17.40	21.35	347	5	McIntosh
June 30th	H.P. & M.A.	Hand'y Page	G-EASN	London	Paris	09.05	12.10	—	1	McIntosh
	H.P. & M.A.	Hand'y Page	G-EATJ	London	Paris	11.40	—	1	—	Bager
	H.P. & M.A.	Hand'y Page	G-EALX	London	Brussels	12.10	—	2	1	Wilcoxson
	H.P. & M.A.	Hand'y Page	G-EASN	Paris	London	14.15	17.45	612	5	Olley
July 1st	H.P. & M.A.	Hand'y Page	G-EASZ	London	Paris	12.35	16 15	155	5	Foot
	H.P. & M.A.	Hand'y Page	G EALX	Brussels	London	—	15.25	45	2	Wilcoxson
July 2nd	H.P. & M.A.	Hand'y Page	G-EASL	London	Brussels	12.45	14.45	—	1	Olley
	H.P. & M.A.	Hand'y Page	G-EATJ	Paris	London	12.35	15.35	165	7	Bager
	H.P. & M A.	Hand'y Page	G-EASZ	Paris	London	12.45	15.55	455	3	Foot
July 3rd	H.P. & M.A.	Hand'y Page	G-EATH	London	Paris	12.15	16.15	210	7	Capps
	H.P. & M.A.	Hand'y Page	G-EASM	London	Paris	12.35	15.00	417	6	Beal
	H.P. & M.A.	Hand'y Page	G-EASL	Brussels	London	12.35	15.00	130	5	Olley

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; H.P. & M.A.—Handley Page and Messageries Aeriennes. I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company, M.W.T.C.—Marconi Wireless Telegraph Company.
Where times are missing it is probably owing to Atmospherics affecting signals.

Inland Flying at Croydon.

June 28th.—Mr. Raynham, from Brooklands and back on Martinsyde G-EAQH Hispano-Suiza.

June 29th.—I.A.L., 3 tests D.H.4a (G-EAMU).

June 30th.—A.T. and T., Ltd., 3 joy-rides.

July 1st.—Sopwith "Snipe" (R.A.F.) from Northolt to Kenley; A.T. and T., Ltd., 1 test, D.H.9.

July 2nd.—H.P. and M.A., 1 Avro from Cricklewood (return); 1 Bristol from Bristol (for Hendon Pageant).

July 3rd.—A.T. and T., Ltd., 4 joyrides, 1 Avro test; I.A.L. D.H.4a to Hendon (return); 1 Bristol to Hendon (G-EAIZ).

July 4th.—A.T. and T., Ltd., 1 D.H.16 test.

Inland Flying at Cricklewood.

June 28th.—Handley Page G-EATG to Croydon for Brussels.

July 3rd.—H.P. G-EATJ and G-EASV to Margate, return, 12 and 15 passengers respectively.

H.P. G-EATG to Hendon, return, for Pageant, 44 passengers carried.

"What One Can Do If One Wants To When One Tries."

As an example of the inaccuracy of official communiqués, it may be of interest to quote the following :—

From Arrivals and Departures Table, from office of Controller of Information, June 28th. Time, 13.45. No. 86 :—

"H.P. G-EATG left Croydon for Paris 12.45, with four passengers."

From Arrivals and Departures, June 28th. Time, 18.15. No. 87 :—

"*Handley Page G-EATG arrived Brussels from Croydon 15.10.

"* Correction.—This machine on previous message was reported to us as proceeding to Paris. Please note correct destination is 'Brussels' as above."

From "Messages sent out direct by Communication" June 28th-June 29th, 1920, received between 18.15 and 09.00. Arrivals and departures :—

BY AIR TO EVERYWHERE

THE most enjoyable, most comfortable and quickest route to the Continent is the Airway. The LepAerial staff of experts can give information and advice on all matters concerning travel.
Bookings on all Air Lines.

PARIS.

Three services daily each way London-Paris.
Leave each city 9.30 a.m., 12.0 noon, 4 30 p.m.
Fare: £10 10s. od. single, £18 18s. od. return.
Machines: Airco, Handley Page, and Instone Vickers Limousines.

AMSTERDAM.

Tri-weekly service each way London. Amsterdam.
Leave London on Mondays, Wednesdays, and Fridays 10.0 a.m.
Fare: £15 15s. od. per passenger.
Machines. Airco 16 Limousines.

BRUSSELS.

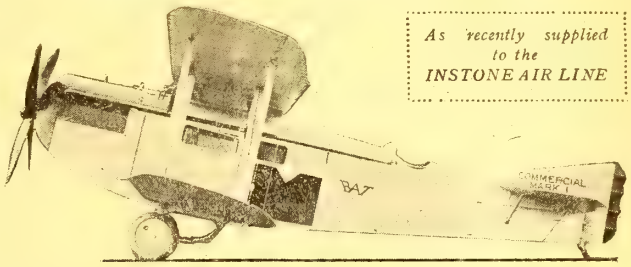
Tri-weekly service each way London-Brussels.
Leave London Mondays, Wednesdays, Fridays 12.0 noon.
Fare: £10 10s. od. single, £18 18s. od. return.
Machines: Handley Page Limousines.

TAXIPLANES.

LepAerial Taxiplanes for Two, Four or Eight Passengers can be sent to any part of Europe at an hour's notice. The fare per passenger is FIFTEENPENCE PER MILE.
Machines have been sent to Copenhagen, Amsterdam, Cologne, Brussels, &c., &c.

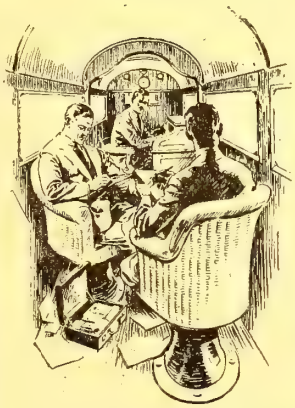
LEPAERIAL TRAVEL BUREAU,
Criterion Corner, Piccadilly Circus,
LONDON, W.1.

Telephone - - - - GERRARD 4387.



As recently supplied to the INSTONE AIR LINE

The Ideal Commercial Aeroplane



An impression of the interior fitted out as an aerial office.

The machine here illustrated is the B.A.T., universally acknowledged to be the most practical and efficient commercial aeroplane yet produced. Although a relatively small machine—only 34 feet over-all length—it possesses surprisingly commodious cabin and cargo accommodation. Four passengers can be carried comfortably, with ample room for personal luggage, or, alternatively, parcels or mails to the extent of 1,000 lbs in weight and **150 cubic feet in capacity.**

The B.A.T. as a commercial machine has so many natural advantages and is so moderate in first cost, that it is really the ideal machine to employ in inaugurating air transport services

A demonstration flight can be arranged and all particulars obtained on application to.—

BRITISH AERIAL TRANSPORT Co Ltd
38. CONDUIT ST. LONDON W.

SUNBEAM

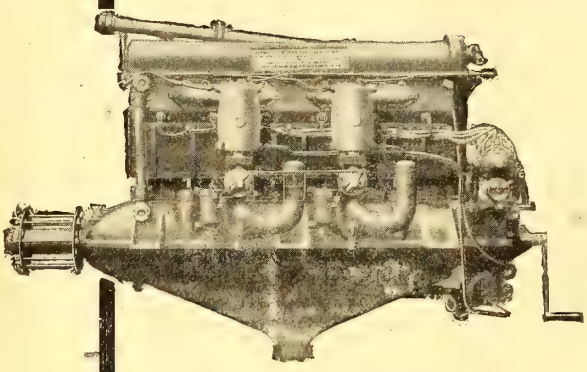
AIRCRAFT

will

placed on

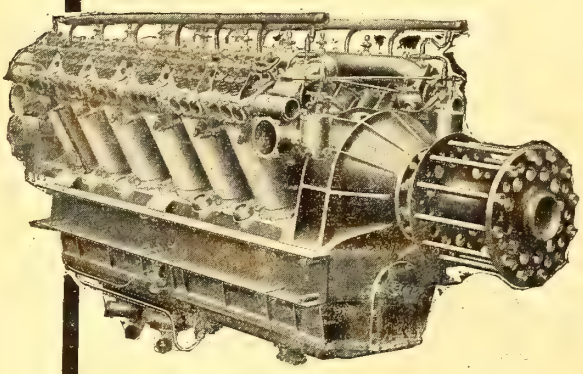
at

Olympia Stand



"DYAK" 100 h.p.

Specially for small Airships. Can also be used for Aeroplanes.



"SIKH" 800/900 h.p.

Specially suitable for large Aeroplanes, and also applicable for Airships.

THESE well-known engines, power and with a wide all aviation requirements, will with the greatest interest

The four aircraft engines here on the stand, where also will Sunbeam design

THE SUNBEAM MOTOR CAR CO., LTD.,

Export Department : 62, Oxford

COATALEN

ENGINES

be

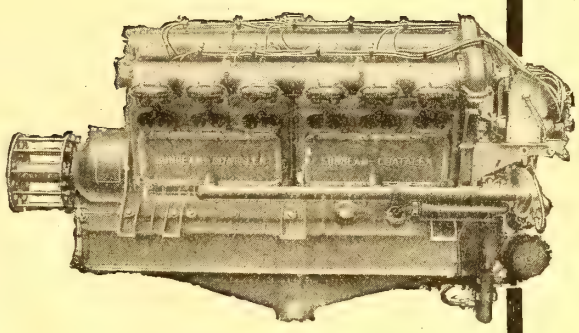
exhibition

the

Show—

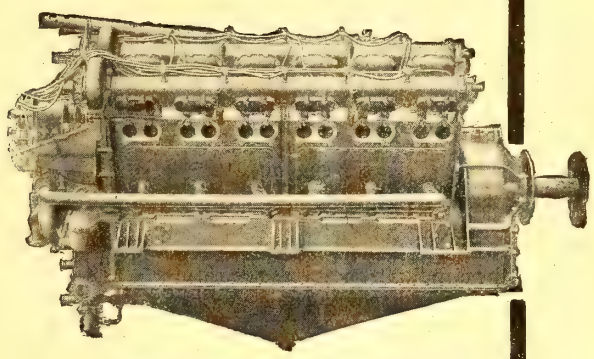
56.

of proved efficiency and range of adaptability to without doubt be studied by visitors to the Show.



"MANITOU" 300 h.p.

Suitable for Aviation purposes of al kinds.



"MATABELE" 400 h.p.

Suitable for Aviation purposes of all kinds.

illustrated will be displayed be found other examples of and manufacture.

MOORFIELDS WORKS, WOLVERHAMPTON.

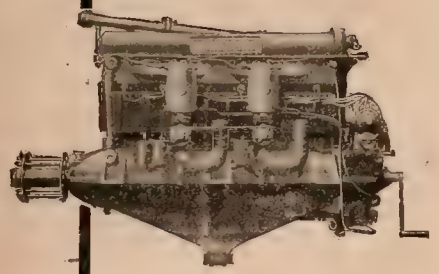
Street, London, W.1, England.

SUNBEAM-COATALEN

AIRCRAFT ENGINES

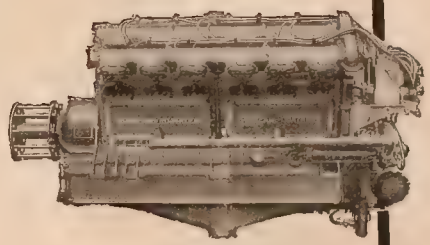
will be placed on exhibition at the

Olympia Show—Stand 56.



"DYAK" 100 h.p.

Specially for small Airships. Can also be used for Aeroplanes.



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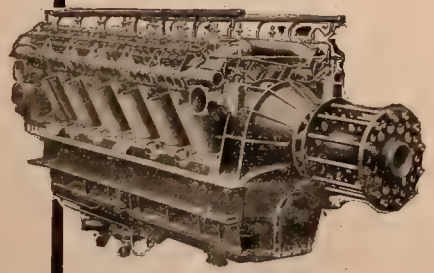
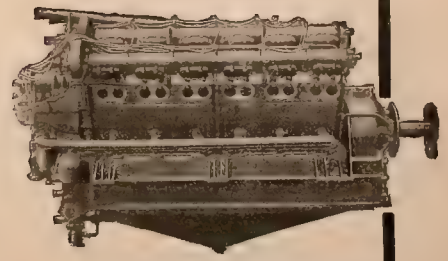


"SIKH" 800/900 h.p.

Specially suitable for large Aeroplanes, and also applicable for Airships.



"MATABELE" 400 h.p.

Suitable for Aviation purposes of all kinds.

THESE well-known engines, of proved efficiency and power and with a wide range of adaptability to all aviation requirements, will without doubt be studied with the greatest interest by visitors to the Show.

The four aircraft engines here illustrated will be displayed on the stand, where also will be found other examples of Sunbeam design and manufacture.

THE SUNBEAM MOTOR CAR CO., LTD., MOORFIELDS WORKS, WOLVERHAMPTON.

Export Department: 62, Oxford Street, London, W.1, England.

"H.P. G-EATG left Brussels for Cricklewood 12.00, with two passengers.

"H.P. G-EATG arrived Cricklewood from Brussels at 16.10, with three passengers."

So that while this interesting machine was flying from Croydon to Paris between the hours 12.45 and 15.10, in addition to changing its mind and going to Brussels, it was also flying from Brussels to London between the hours of 12.00 and 16.10. It will also be noted that apparently an interesting event took place during the latter trip.—C. D.

The England-Holland Air Mail.

It is announced that the new mail contract, the details and regulations governing which will be found at the head of C.A.T. notes, has been granted to Handley Page Transport Ltd. The service was to begin on July 5th, but owing to bad weather the machine, a D.H.9, was prevented from starting.

The Instone Air Line.

The D.H.4a has been working hard during the week. The Bat is being looked over in case the engine was damaged and the engines on the Vimy are still giving trouble.

Mr. Barnard joins the ranks of the Benedicts on Saturday. One regrets the unavoidable absence of G-EART.

The new passenger rates are a great success. The I.A.L. allow a reasonable amount of personal luggage to be taken free of charge. This should not exceed 30 lb., but if space is available this amount is not strictly checked.—G. D.

Bournemouth

An aerial service between Bournemouth and Weymouth was established on Saturday, July 3rd, when passenger flights between these two towns were inaugurated. This has been arranged by the Bournemouth Aviation Company.

Rights appertaining to the use of the foreshore were acquired last year by Bournemouth and Southampton companies but of these no advantage has yet been taken.—H. F.

Manchester.

The Manchester Aviation Company, which has its offices at 41, John Dalton Street, Manchester, was formed this year for the purpose of providing passenger flights in the Northern area, and for the hire of machines for fêtes, etc. The partners of the company are Messrs. R. Turner, C. Bernard Wilson, E. Lawrence Wilson, R. Foster, R. Turner, and H. M. Hart.

Last week the company was flying at Congleton Road, Macclesfield, and will continue there for another week or ten days. After leaving Macclesfield another Lancashire town will be visited, but, at the moment, no particular one has been nominated.

Northolt.

Miss Imelda Trafford, the only woman pilot to hold the Air Ministry's "A" Licence, gave an excellent display of "stunt" flying at the Central Aircraft Co.'s aerodrome, Northolt, on Sunday afternoon (July 4th). Over 300 people who were spending the afternoon at Northolt were a keen audience. Miss Trafford, at about 2,000 ft., looped, banked, and spun. Then, rising to 4,000 ft., she came down in a beautifully executed spiral to 800 ft., and from that height made a sideslip landing.

Southampton.

A DEMONSTRATION TO THE PORT OF LONDON AUTHORITY.

A committee appointed by the Port of London Authority visited the works of the Supermarine Aviation Works, Ltd., on July 2nd to have demonstrated to them the navigability and handiness of the firm's flying boats in a busy waterway.

This committee is the outcome of a request on the part of the Supermarine Aviation Works to run a mail service from the Thames in London over the North Sea to Holland, etc. July 2nd was a bad day from the point of view of flying, but for the demonstration was ideal. A strong wind was blowing up the Itchen across the Supermarine slipway with occasional showers of rain, and the river itself was thick with all manner of craft to which must be added the Woolston Floating Bridge which is continually crossing the stream.

Capt. J. E. A. Hoare (late R.N.A.S. and R.A.F.) took the party up two by two and gave an excellent demonstration of the navigability of the Supermarine "Channel" type floating-boat by landing in the middle of the stream and taxying in amongst all the craft, a feat which was not rendered easy by the strong cross-wind.

It could be assumed from the remarks of the committee that the demonstration was successful and one may hope to expect that the enterprise of the S.A.W., Ltd., will shortly bear fruit. The possibilities of running aerial mails by flying boats from the heart of London, off the Thames, are enormous, and assuming that the charge will be sufficiently reasonable, the advantages of eliminating an unnecessary journey to an aerodrome on the outskirts of London and from there using land-going aircraft for a journey which for the most part is over the sea, will certainly repay any trouble that is likely to be experienced in impressing the authorities at the present time.

THE BRITISH DOMINIONS BEYOND THE SEAS.

CANADA.

A correspondent in Canada writes :—

Edmonton, Alta.—One more use has been found for the aeroplane and this is to act as a lottery medium. The aeroplane christened "The Edmonton" has the distinction of being the pioneer in this line, for during the recent drive for funds for the new Y.W.C.A. building in the provincial capital, a large number of tickets were sold entitling the bearer to a membership of the Association. A limited number of these were marked as Free, and then the whole of the ticket dockets were sent up in an aeroplane and from a respectable height were scattered over the city of Edmonton. Not a few, alas, fell into the Saskatchewan River, two at least were found within the city limits, and one of these by Miss Florence McClung, who achieved temporary fame and free membership through the keeness of her vision.

It is rumoured that the other is in the possession of a worthy Mormon who was passing through the capital en route to Cardston, the Canadian Salt Lake City, and there is some anxiety felt as to whether he will insist on his privileges and prolong his stay in Edmonton as a member of the Young Women's Christian Association.—L. M.

A Montreal-New York Freight Experiment.

Plans have been matured to make the first experiment in the transportation of freight from Montreal to New York by aeroplane. The initial trip will be undertaken by Lieuts. Raymond and Wilshire. The first cargo will consist of a collection of choice silver fox pelts, valued at over $100,000, and will be conveyed in two biplanes for delivery in New York.

All the arrangements were made for the experimental trip by Mr. Harry Silbert, a millionaire American fur dealer, who bought the silver fox skins, which are the product of Prince Edward Island fox farms, at the recent fur auction sales in Montreal. Special arrangements have been made with the American Customs to secure the entry of the valuable cargo.

INDIA.

Progress in India.

The Committee of the Bengal Chamber of Commerce have urged the Indian Government to get into immediate order the Dum-Dum site for the permanent aerodrome which has been definitely decided upon. Other aerodromes are in contemplation at the main centres on the Calcutta to Bombay, Delhi to Karachi, Karachi to Bombay and Calcutta to Rangoon air routes.

The Committee are urging upon the Air Board the value of the aeroplane for commercial purposes and have asked that the Government of India should facilitate civil aviation not only by the provision of proper landing-grounds, but by reducing, as much as possible, the cost of private enterprise in connection with experimental and demonstration services.

It is also suggested that aeroplanes and accessories should be admitted free of Customs duties, and the Committee have pointed out the anomalous state of affairs which admits aeroplanes flying into India without charging duty whilst importation of planes and parts is dutiable.

CIVIL AVIATION DEVELOPMENTS.

Advices just to hand from Calcutta report that the Indian Government is prepared to consider contracts of fifteen years' duration with private firms for the establishment of effective aerial mail transport services for India, Burma and Ceylon. Aerodromes are to be erected for the purpose, the main establishment connected with the Royal Flying Corps being situated at Bangalore.

As an initial step in the encouragement of Indian aviation, the British Government has recently presented to the Indian Administration one hundred aeroplanes, of which four are destined for Burma. A certain number are to be placed in the care of the Indian Princes for special employment in their own territories. A native School of Instruction is being established and the prediction has already been made that a complete Indian Aerial Service will be in existence before the end of 1921.

At the present time Calcutta is the aviation centre for India and is likely to remain so owing to its geographical position. A company has already been registered there, with a capital of 15,000,000 rupees, under the title of Handley Page Indo-Burmese Transport, Ltd., for the purpose of undertaking comparatively short passenger and freight services pending the establishment of permanent long-distance services to suit the commercial needs of the country. An aeroplane works, a school of instruction, and an hotel form part of the objects of the company.

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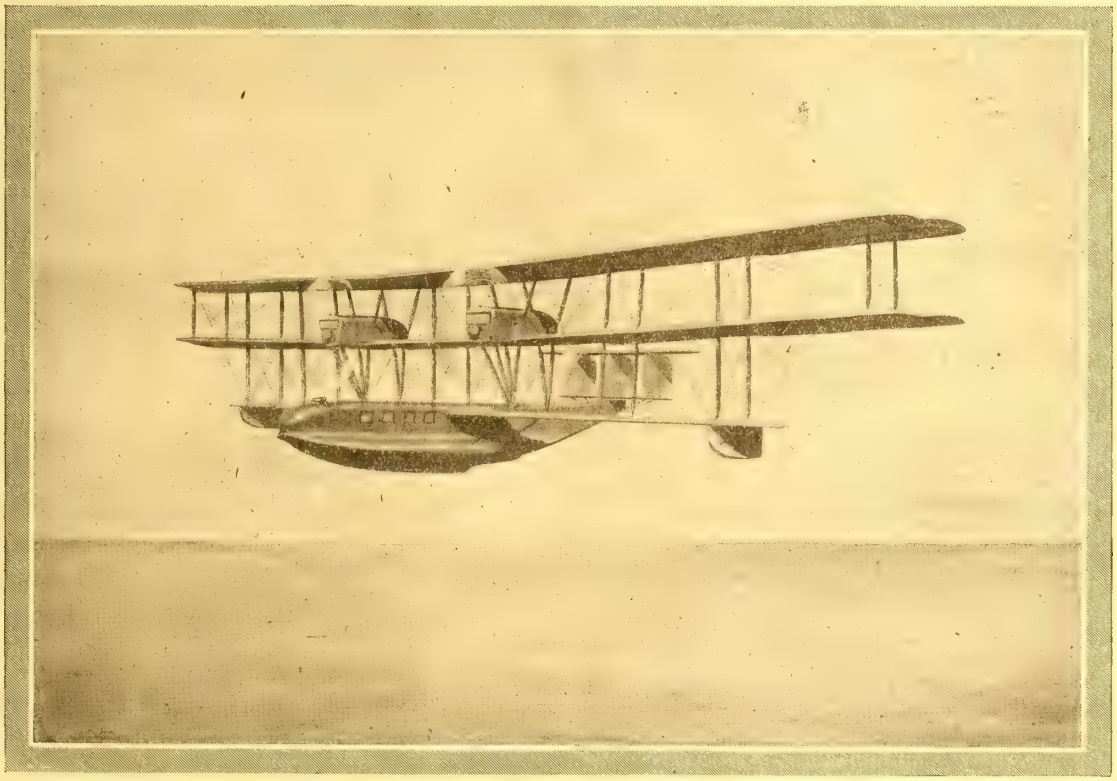

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FOREIGN INTELLIGENCE.

COLOMBIA.

A correspondent in Colombia writes :—

The Colombian-Curtiss Aviation Co., established in the capital (Bogota) last January, are carrying out a large aviation programme which they hope will cover a large part of the Republic.

A large number of the latest Curtiss commercial biplanes which were imported into the country have been put into use with very satisfactory results, and distances up to 300 miles have been covered daily. Aeroplane stations will shortly be opened at Rio Magdalena, on the Atlantic Coast, for a fast passenger and goods service up the river, along which railway communication with the coast is inadequate and slow.

A bi-weekly service, it is hoped, will be maintained. A strong Colombian aviation syndicate is in progress of formation, and is backed by leading Colombian commercial firms. Information regarding this concern is difficult to obtain.

DENMARK.

Aerial Mail Negotiations.

Major Scott-Paine and Colonel Raikes have arrived at Copenhagen from Christiania. They will enter into negotiations with the Danish Governments for the establishment of an aerial mail route between Denmark and England.

FRANCE.

The Tour of Lieut. Roget.

Lieutenant Roget, continuing his aerial tour of Europe, left Lemberg on June 28th at 12.35 o'clock and, owing to the persistently unpleasant weather, had to make a considerable detour in the Carpathians. He landed at Bucarest—his day's destination—at 17.40 o'clock, having covered 750 kilometres (about 460 miles). He flew to Constantinople on July 4th.

The Prize of the "Grand Ecart."

On June 29th the first trials were made in the contest of the "Prix du Grand Ecart," offered by *L'Auto* to the French aviator who on a French aeroplane flies over a three kilometre course twice with the greatest difference between the two speeds. The three entrants were MM. Bossoutrot, Casale, and Pillon. The types of their machines are not given. M. Bossoutrot was classed first on the opening day and M. Casale was disqualified. On the 1st July the trials were continued and M. Bossoutrot again was classed first with the following figures for the three-kilometre course. Slow speed : Mean time for out and home journeys, 7 m. 41 3-10 s.; greatest speed : mean time for out and home journeys, 1 m. 17 2-10 s.

Paris-Madrid Return and Paris-Rome Return.

M. Fronval, who left Paris on June 29th on a Morane-Saulnier with the object of completing a Paris-Madrid-Paris flight in a day, was forced to land owing to bad weather on the return journey and did not reach Paris until July 1st.

M. Maneyrol, who, on the same day, set out for Rome, also with the intention of completing a return flight in the day, was forced to land at Turin in the evening and, at the moment of writing, is still held up there.

Paris-Geneva by Air.

The Paris-Geneva aerial service was successfully initiated on July 1, when the Swiss aviator M. Durafour, on a three-seater Sopwith biplane, with a journalist as passenger, and mails, arrived there across the Jura Alps after a flight of 3 h. 15 m. in splendid weather.

M. Durafour hopes to reduce the time later. He left Paris at 09.15 and arrived at Geneva at 12.30.

HOLLAND.

A Dutch Aerial Transport Company.

The following communication has been received from the Administrator of the Koninklijke Luchtvaart Maatschappij voor Nederland en Kolonien :—

Our Company is formed entirely of bankers, shipowners and such like, and we have been most careful to include no aircraft manufacturers. Our reason for this is that, as a transport company, we desire always to use the best machine of the age, of whatever nationality it may be, and we must therefore be entirely free from manufacturers.

In forming our transport company we have tackled a very difficult proposition and we are fully aware of the fact that financially, at any rate, it cannot prove itself a success for a little while. Still, being thoroughly convinced that civil aviation must and will come, we are doing our utmost to further its interests to the best of our power.

On May 17th, 1920, we opened a line from Amsterdam to Croydon upon alternate days. This was so far a success as to encourage us upon June 28th, 1920, to increase this service to a daily one. We intend continuing this service until September 15th, 1920.

From July 5th onwards, in addition to carrying goods and passengers, we have also contracted to carry the mail to England.

This service is only a trial service, and for this reason we discontinue after Sept. 15th in order to review the whole situation at our leisure and to decide upon necessary alterations. The winter months will give us time to work out our various ideas, as our eventual ambition is naturally upon a much larger scale than the running of merely our air line.

Next year we are hoping to open lines from Amsterdam to Paris, Frankfurt, Berlin or Hamburg, in co-operation with a line to Copenhagen.

We are also members of the I.A.T.A.

We are hoping for good results in civil aviation in our Dutch East Indies and are planning air lines between Medan, Singapore, Batavia, Soerabaya, these to be carried out with flying boats.

NORWAY.

An Accident.

A Handley Page aeroplane flew from Christiania to Stockholm on June 30th. When starting for Christiania the following day the machine met with an accident, the occupants being injured, but not dangerously. Flight-Sjt. W. Roger, an Englishman, was the pilot.

A Horten-Stockholm Flight.

A Norman Thompson flying boat, which started from Horten, on the Christiania Fjord, arrived at Stockholm on July 1st.

SPAIN.

A New Pursuit for Aviators.

At the Vista Alegre Plaza in Madrid, on July 1st, four aviators, in order to assist a fund for the widow of Captain Collier, who was killed in a flying accident at Saragossa in April, appeared as bull fighters in a specially organised bull fight. Of these one was an Englishman, Captain Truelove, and the others were, respectively, Spanish, French and Italian.

Young, small and active bulls were used. Each bull fighter killed his animal, though the work was clumsily done save in the case of the Englishman, who finished his bull with a single stroke of the sword. The spectators, enthusiastic and generous, presented the bull's tail and ears to the amateur bull-fighter, who, equally generous, flung them back to the crowd in a spirit of courteous self-sacrifice.

UNITED STATES OF AMERICA.

A correspondent in America writes :—

Aerial Races at Miami, Florida.

During May some very successful races were held in the neighbourhood of Miami and were well attended by aviation and motor-boating enthusiasts. Flying was confined to seaplanes exclusively of the flying-boat type for this type seems to predominate in America and the land type aeroplane plus floats is not frequently seen.

A touch of novelty was introduced by the promoters, who arranged a race between "express cruisers" and flying boats. Few particulars of interest are, however, to hand.

The Aero Limited seaplane secured a good win over the E. B. Thomas triplane in its race, the latter seeming to be handicapped somewhat by excessive plane surface and lack of well-designed streamlining. The Aero Limited was equipped with 400-h.p. Liberty engines.

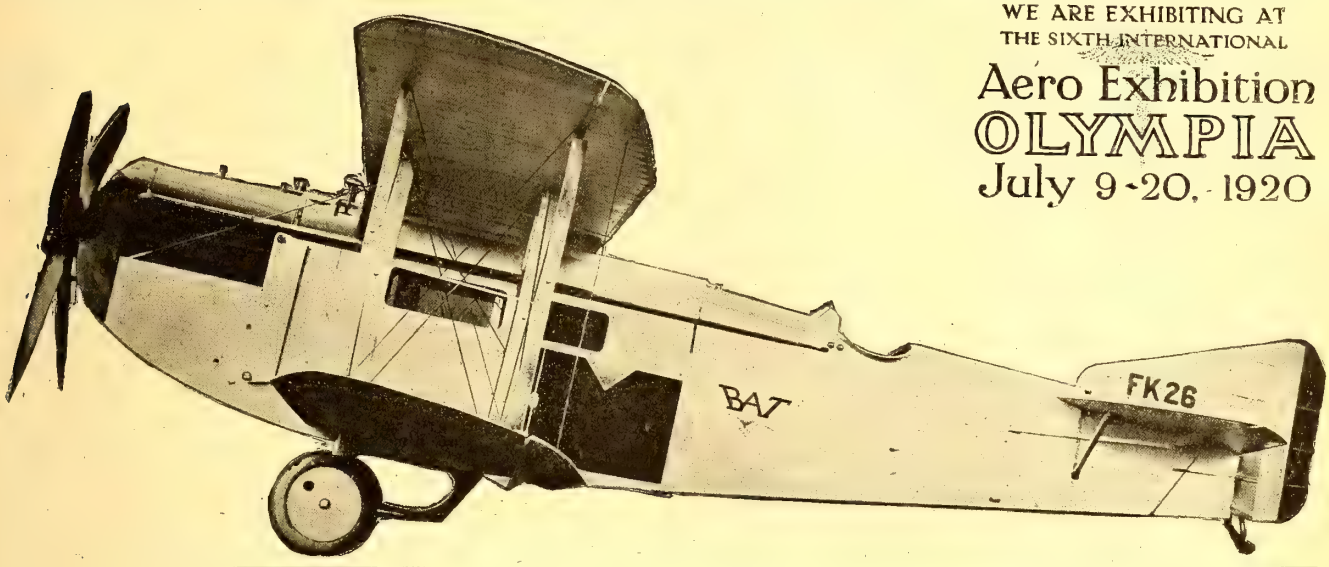
Incidentally a feature of interest worthy of mention was seen on the "express cruiser" called the "Gar Jr." which was the winner of the 20-mile race for its class and of an unofficial world record for the distance, and that was the adaptation of the fin and rudder of aeroplane type set aft with a view it is presumed to giving greater stability on turns at high speeds, the rudder mentioned was, of course, supplementary to the usual marine type one. The "Gar Jr." was also equipped with an Aero model 400-h.p. Liberty motor.—L. M.

The Smuggling of Whiskey.

The shortage of alcoholic drink in the United States of America has, it would appear, attracted sympathetic attention in Canada. The decline of spirit in the citizens of the great Republic should not, it is true, unduly perturb their imperial neighbours, but kindly feelings of high market value are not yet lacking in the one-time New France.

It is reported from Des Moines, Iowa, on May 25th, that the U.S. police were searching for an aviator who brought, on May 24th, according to official rumour, eighteen cases of whiskey as contraband from Winnipeg. If the police are to be believed, these cases were sold within two hours of arrival at 250 dollars a case. The police, with Yankee dogmatism, say that the smuggler's aeroplane left Winnipeg at 8.30 a.m. and covered the 560 miles thence to Des Moines in seven and a half hours. It seems that the police are, or say they are, in the possession of the aeroplane.

The story is good, but it is from the United States of America, and its veracity, if any could initially be admitted, fails entirely in view of a statement from Winnipeg that no aeroplane capable of carrying so large a load for 560 miles exists or has existed in that district.



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Load:—With 600 mile range oil fuel—1,000 lbs.

Fuel Cost at Full Load:—7.2 pence per mile.

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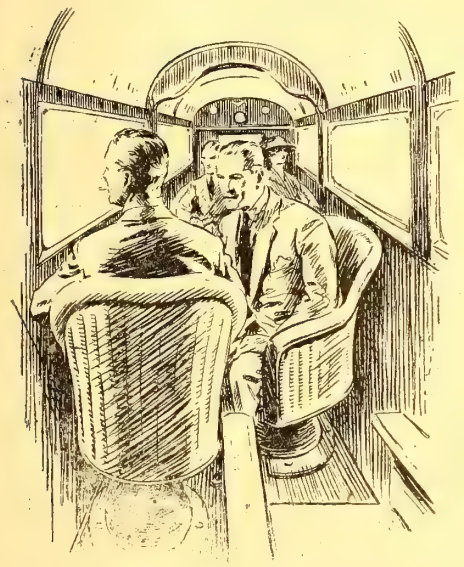

An impression of the interior of the cabin of the Bat-Commercial.

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The AEROPLANE is now publishing on behalf of the Proprietors the **AERONAUTICAL DIRECTORY OF THE WORLD,** which will also be on sale, price 21*s.* net.

The Publishers hope to have ready in time for the Exhibition Captain Swinton's **AEROPLANE HANDBOOK,** which will be issued at 21*s.* net.

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"A few months ago it became evident that the only safe course was to provide facilities for the manufacture of our own body work, and mainly with this object in view we acquired a controlling interest in A. V. Roe and Co., Ltd., who have excellent factories both in Manchester and at Hamble, near Southampton; their Manchester works could hardly be better suited for our purpose, but naturally will require a considerable working capital in order to produce the best results. I should like to make it clear in this connection that we are most anxious not to hamper in any way the future development of aeroplane manufacture in this country. Commercial aviation is certain to come on a large scale sooner or later; and no one in Great Britain did more valuable work as a pioneer, both before and during the war, than Mr. A. V. Roe. (Cheers.) His was actually the first machine to fly in England, and ever since those early days his firm has been in the front rank, both in the design and manufacture of the safest and most reliable types. All we say at the moment is that we cannot afford to run the aeroplane business as a philanthropic institution. There are special difficulties owing to the enclosed nature of our small islands, which put us on a footing very different as compared with America and France, and which necessitate a far more efficient organisation in the way of landing grounds and other facilities for safe transit in bad weather, but for these very reasons it would seem essential to the ordinary lay mind that we should obtain every possible help and encouragement from the Government. Surely, in future, our superiority in the air will be just as essential a safeguard as our supremacy at sea. In the meantime, until the Government has made up its mind as to how it is going to act, the provision of a large quantity of what we hope and expect will be profitable work for the Roe Co. will enable it to retain the best of its labour and to improve still further its staff and organisation."

THE ROYAL AERONAUTICAL SOCIETY.

Olympia Aero Show.

Arrangements have been made for a reception-room for the use of members to be available during the Aero Show, which is to be held at Olympia from July 9th to the 20th. Stand numbers 94 and 95 have been allotted for this purpose by the Exhibition Committee and will be found immediately on the left of the Hammersmith Road entrance. A telephone, which may be used free by members, will be installed (No.: Hammersmith 2130). The room will be fitted up as a sitting-room and current numbers of aeronautical papers will be transferred from the Library at 7, Albemarle Street.

Journal.

The July issue of the "Aeronautical Journal," which is on sale to non-members, price 3s. 6d., contains Commander Hunsaker's paper on "Naval Architecture in Aeronautics," including five appendices which were not read at the meeting These appendices, which will not be published elsewhere, contain a large amount of information which has been specially released by the United States Navy Department, including details of the construction of the N.C. type Transatlantic flying-boats which have never before been published in any country The paper constitutes a complete survey of American methods of design of both lighter and heavier than air craft, and is therefore of great importance.

The same issue of the Journal also contains a short paper on Propellers by Dr. H. C. Watts. Owing to extreme pressure of space Major Linton Hope's paper will appear in the August issue

Wilbur Wright Lecture.

Through inadvertence the name of Major F. H. Barnwell was omitted from the list of members of Council present at the dinner before the Wilbur Wright Lecture.

Lectures at Olympia.

At the request of the Air Ministry a series of popular lectures has been arranged in the Concert Hall at Olympia at 3 p.m. on various afternoons during the Show.

The following is a preliminary list of these lectures, details of which will be announced from day to day during the Show :—

"How Airmen find their Way," Major W. H. Wimperis.
"Airships of the Future," Sqdn. Ldr. Pritchard.
"Kite Balloons," Mr. Griffith Brewer.
"Flying-Boats," Capt. D. Nicolson.
"Trans-Continental Flying," Capt. P. D. Acland
"Development and Future Possibilities of Aeroplanes," Mr. F. H. Green.

Air Ministry Library.

Permission has been obtained from the Air Council for technical members of the Society to use the Air Ministry Library for reference purposes on production of letters of introduction signed by the Secretary of the Society Any members desiring to avail themselves of this privilege should therefore apply to the Secretary for a formal letter of introduction.

W. Lockwood Marsh,
Secretary.

7, Albemarle Street, W.1,
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THE ROYAL AERO CLUB.

First Race Meeting, 1920.

The Aerial Derby (under the Competition Rules of the Royal Aero Club and the Regulations of the Federation Aeronautique Internationale) at the London Aerodrome, Hendon, N.W. (by arrangement with the Grahame-White Co., Ltd.), on Saturday, July 24th, 1920, at 3.30 p.m.

Prizes.—The following Cash Prizes will be presented by the Royal Aero Club :—

Fastest Time (Winner of the Aerial Derby), £500.

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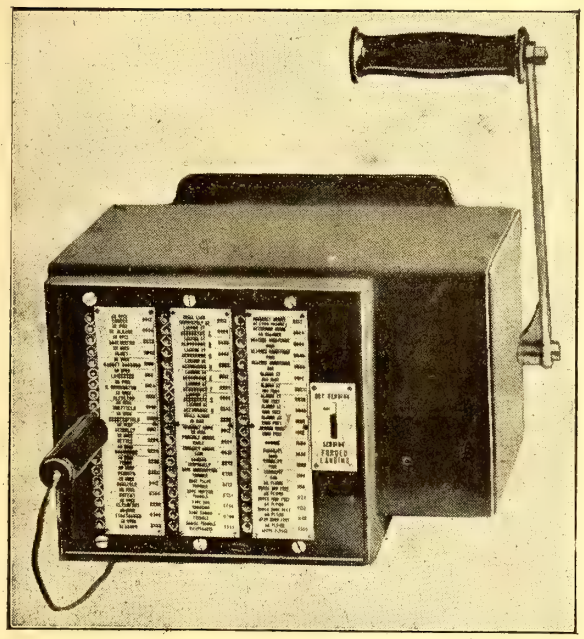

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REGULATIONS.

Qualification of Competitors.—The Competition is open to persons of any nationality holding a licence issued by any Aero Club affiliated with the Federation Aeronautique Internationale.

Organisation.—The Competition shall be conducted by the Royal Aero Club under the Competition Rules of the Royal Aero Club and the Regulations of the Federation Aeronautique Internationale.

Course.—The Course is approximately 200 miles, and will consist of a double circuit of London, starting from the London Aerodrome, Hendon, with the following turning-points:—Brooklands Aerodrome, Weybridge; Epsom; West Thurrock; Epping; Hertford.

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The following entries have been received:—

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PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATHS.

McCUDDEN.—On July 4th, Mr. William Henry McCudden, the father of the late Major J. T. B. McCudden, V.C., D.S.O., M.C., M.M., died in Wandsworth Hospital as a result of serious injuries caused by a fall from an electric train between Waterloo and Vauxhall, on July 3rd. Born in 1854, he had served for 28 years in the Royal Engineers, and retired as Serjeant-major.

SADLER.—On June 24th, Donald Hastings, the only son of Mr. and Mrs. H. V. Sadler, was accidentally killed while flying at Peterborough, at the age of 21.

SWANSTON.—Flying Officer John Romilly Swanston, D.F.C., R.A.F., was killed on June 28th while testing a machine in India. He was the second son of the late Clement Romilly Swanston and Mrs. Bertie White, and stepson of Mr. Bertie White, of 254, Worple Road, Wimbledon, and was 22 years of age

MARRIAGE

BEATSON—ELLIS.—The marriage took place on June 30th, at Christ Church, Lancaster Gate, of Major Claude Gordon Beatson (private secretary to the Chief of the Air Staff) to Miss Lilias Mary Ellis, daughter of the late Mr. Clement Campbell Ellis and Mrs. Ellis, of Kniveden Hall, Leek, Staffordshire.

ENGAGEMENT.

TRENCHARD—BOYLE.—The marriage arranged between Air-Marshal Sir Hugh Trenchard and the Hon. Mrs. James Boyle, daughter of the late Edward Salvin Bowlby, will take place at St. Margaret's, Westminster, on July 17th, at 2.30 p.m. Friends will be welcome at the church. There will be no reception afterwards

BIRTH.

BIGGS.—On June 25th, at a nursing home, the wife of Flight Lt J. P. P. L. Biggs, M.B.E., R.A.F., of a daughter

IN MEMORIAM.

McCUDDEN.—To the memory of our dear son and brother Jim (Major J. T. B. McCudden, V.C., D.S.O., M.C., M.M., R.A.F.), killed on his way to duty in France, July 9th, 1918, aged 23 years. R.I.P. From his sorrowing Mother, Sisters and Brother.

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COMING EVENTS.

JULY.

7th, Wed.—Exhibition of Air Paintings by Mr. Geoffrey Watson at Brook Street Art Gallery, Bond Street, W.1, in aid of R.A.F. Memorial Fund.

8th, Thurs.—R.A.F. Memorial Fund Dance at Ritz Hotel, W. Tickets, 2 guineas, from R.A.F. Memorial Fund, 7, Iddesleigh House, Caxton Street, S.W.1.

9th, Fri.-20th, Tues.—International Aircraft Exhibition at Olympia, London.

12th, Mon.—*Aeronautics* Dinner to Pioneers of Aviation at Connaught Rooms.

17th, Sat.-29th, Thurs.—Antwerp Seaplane Meeting.

24th, Sat.—Aerial Derby at Hendon.

AUGUST.

3rd, Tues.—British Government Competition, large and small type Aeroplanes, at Martlesham Heath.

25th, Wed., 26th, Thurs.—R.A.F. *v.* Army Cricket Match at the Oval.

28th, Sat., 29th, Sun.—Schneider Cup Race at Venice.

SEPTEMBER.

1st, Wed.—British Government Competition, Amphibian Competition at Felixstowe.

8th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva

27th, Mon.—Gordon Bennett Aviation Cup Meeting near Paris begins. Day to be announced.—Lake Garda International Seaplane Race.

OCTOBER.

2nd, Sat.—Gordon-Bennett Aviation Cup Meeting near Paris closes.

23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis

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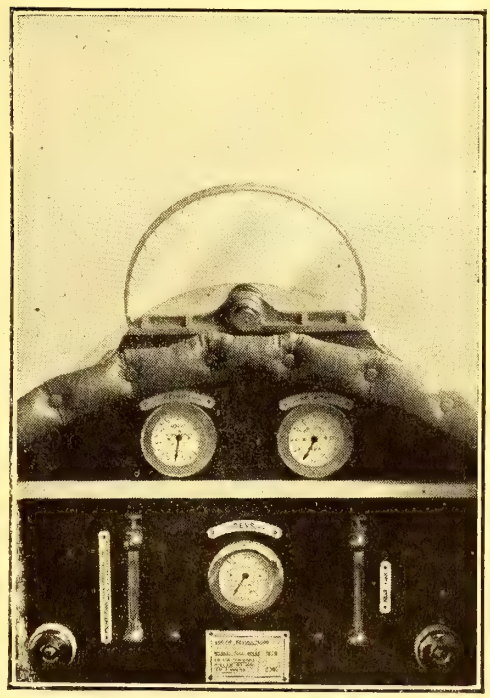

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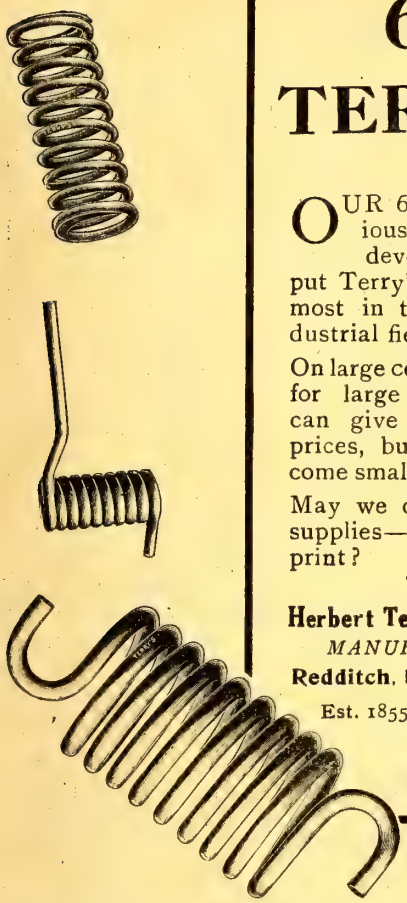

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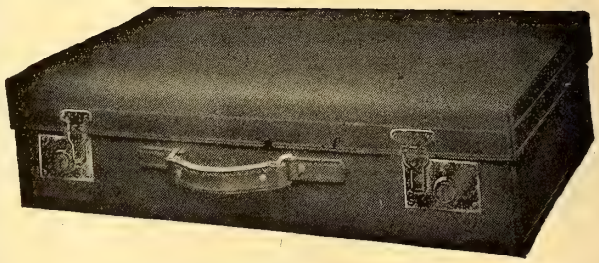

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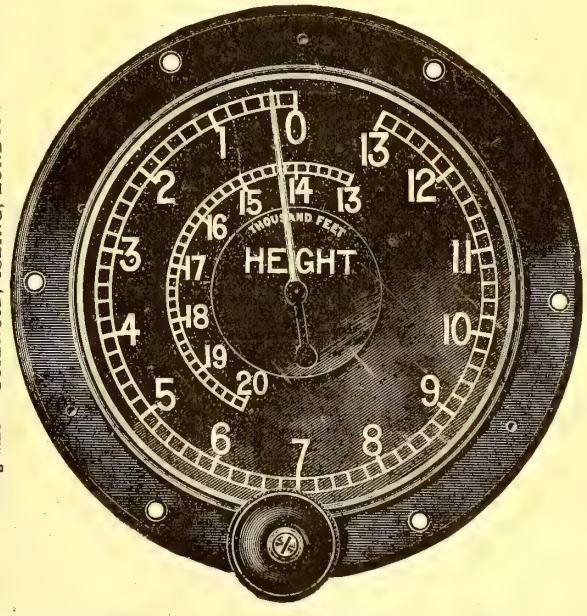

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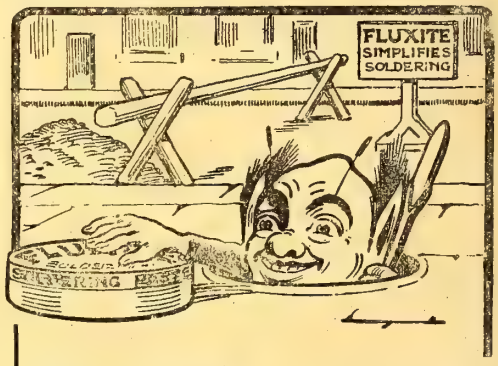

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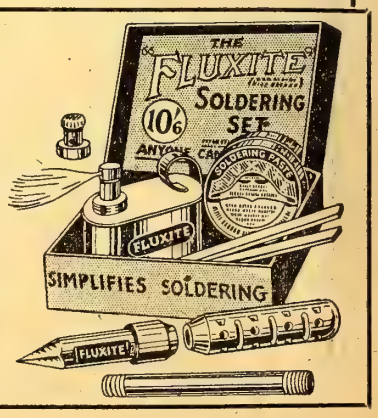

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1ST REPORT OF THE AERO SHOW.

THE AEROPLANE

Edited by C. Gray

WEDNESDAY, JULY 14, 1920.

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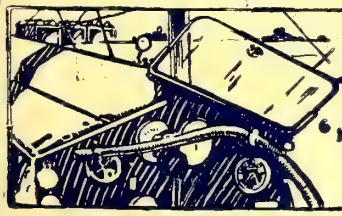

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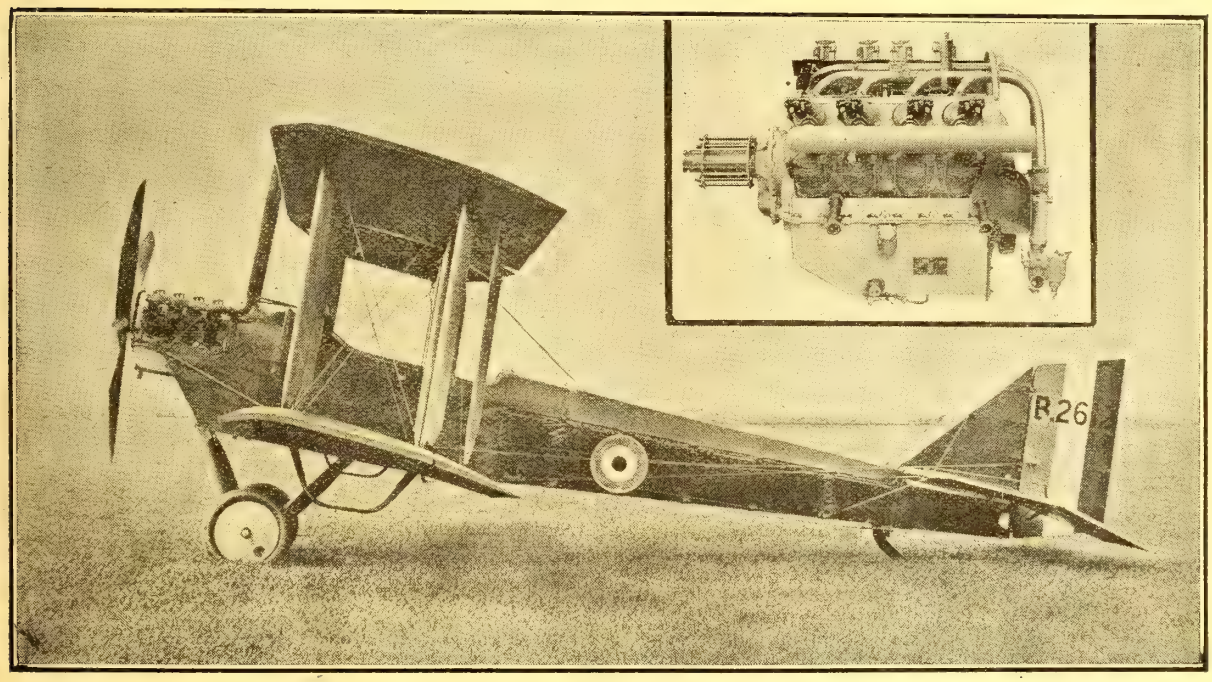

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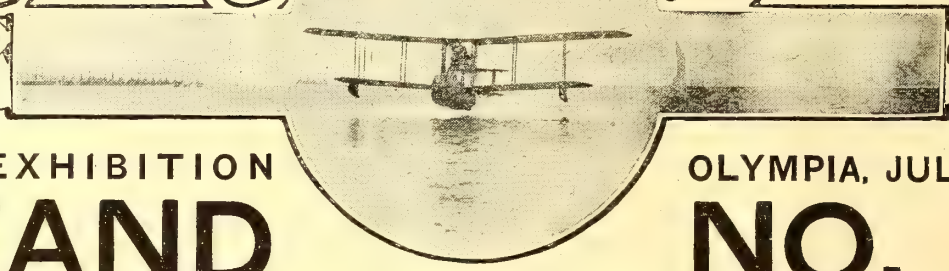

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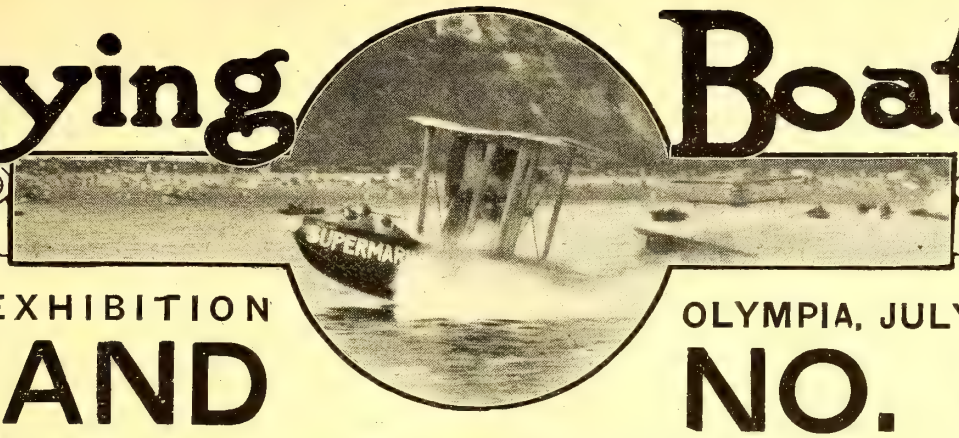

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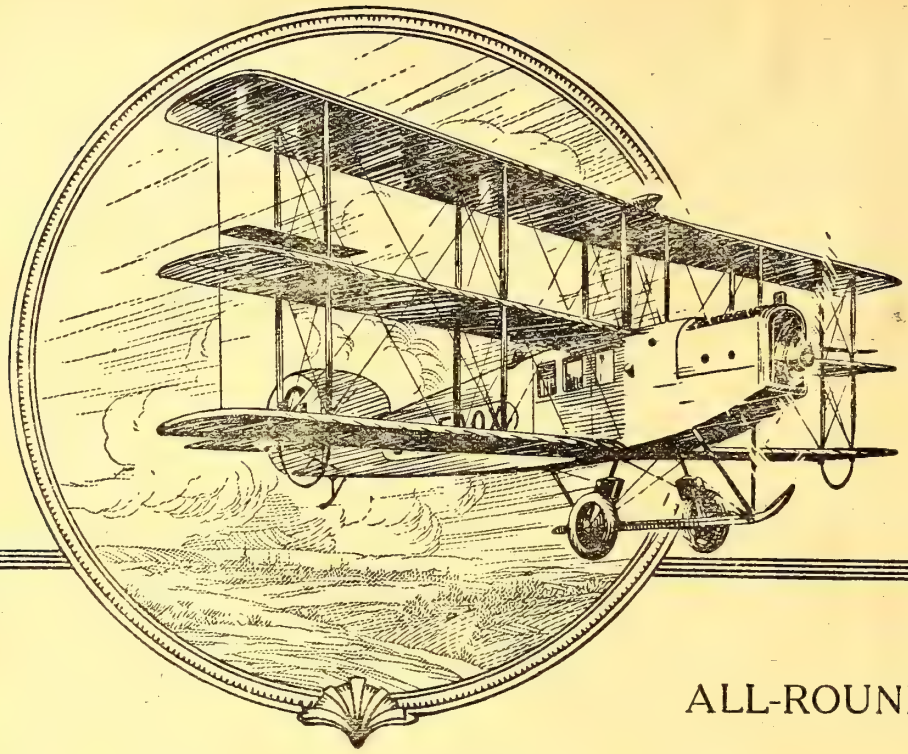

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ON THE AERO SHOW.

There is no doubt about it. The Aero Show is a very fine affair. The British Aircraft Industry in general, and the Society of British Aircraft Constructors in particular, have every reason to be proud of themselves—at any rate those who have had the pluck to show their products have reason to be proud. For they have demonstrated conclusively the high level of design and construction achieved in this country. One is perfectly sure that no other country has such an altitude record.

Over and above the Aircraft Industry the Air Ministry deserves the thanks of everybody for its assistance, not only in making the Show more interesting with its exhibits, but for providing such convincing evidence of the manner in which the high standard of British aircraft construction has been attained and is being maintained. Overseas buyers of aircraft cannot help being convinced that machines which are built to the theoretical requirements of the Technical Department and which pass the airworthiness examinations of the Aeronautical Inspection Department are thoroughly reliable vehicles of transport and are well worth the extra cost over and above those produced in countries where aeroplanes, like Topsy, have "just growed."

An Error of Judgment.

There are those who have said, after a cursory glance at the machines at Olympia, that there is little difference between the aeroplanes of to-day and those of 1914. How wrong-headed such people are is neatly demonstrated by Captain W. H. Sayers, late of the Technical Department, Air Ministry, and now Technical Editor of this paper, who, in his illuminating and humorous prefatory remarks to the report on the aeroplanes at Olympia, which appears in the Aeronautical Engineering Supplement of this issue, proves by such simple arithmetic that one is even able to understand it oneself, that the cost of aerial transport to-day is precisely half what it was before the war. And this in spite of five years of development in which cost was entirely negligible and in which high performance was the sole objective.

One does not propose here to describe the aeroplanes in detail, for that is done very fully under Captain Sayers' supervision in the Engineering Supplement, where the description is aided by Mr. Leonard Bridgman's clear and educative sketches. But one would like to draw attention to the fact that the Show demonstrates fairly clearly that we have nothing more to fear from our much-boomed German cousins than we have from our cousins across the Atlantic.

British Successes.

Such machines as the huge Bristol "Pullman" (which incidentally is described by an "expert" in the *Sunday Times* as a one-twentieth scale model), the Vickers "Vimy" and the Handley Page "W.8," though perhaps less ambitious than the Siemens-Schuckert and Zeppelin-Staaken giants, are at any rate proved flying machines with speeds which would puzzle the best "chaser" machines used in the War in 1917 or thereabouts.

The Short all-metal biplane, nicknamed by the irreverent the "Sardine," is a proved engineering job, as light as a wooden machine, and structurally it is far in advance of the famous Junkers monoplane with its multitudinous wing-spars, half of which do no more work than a British bricklayer and might perfectly well be scrapped. The Fairey float seaplane and the Supermarine boats demonstrate that when it comes to seagoing aircraft, as distinct from racing freaks fit only for glassy calm water, we as a nation can at any rate ride the sea even if we cannot rule it into straight lines. The Vickers "Viking" reminds us that we can do equally well on land and sea. And the Blackburn torpedo machine shows how we may do without a Navy ourselves and abolish the navies of other nations.

The regular transport machines, such as the Sopwiths and the Martinsydes and the Beardmores and Bats and the Westlands and the Avros and the Bristol "Coupé" and C.A.C. and the Short sporting seaplanes demonstrate our ability to turn out a workmanlike job perfectly suited to its purpose, even though we do not indulge in the French taste for pink-inside decorations. Similarly the Baby Avro and the Austin Whippet show what we can do in the way of small cheap single-seaters.

The Cheerful Outlook.

Altogether the firms which actually show machines at Olympia have good reason to be proud of themselves. Even if they do not feel sanguine about a plenitude of orders being thrust upon them this week, they must remember that—as one demonstrated recently—the private owner may be washed out of consideration as a possible customer, and that the air transport lines, which will be their real customers in the future, must be allowed time to develop.

There is certainly no need for pessimism. Some firms may go under, but only if they are badly managed. Those who survive the next year or so will find themselves again making fortunes and, moreover, building up solid businesses quite unlike those which Sir Hugh Trenchard has so graphically described as "the rank growth of war." It is well that the badly managed firms should go under. And it would be the worst of bad policy to keep them alive by means of subsidies.

The first law of Nature is the survival of the fittest. In the great Aircraft Industry of the future only the fittest are desirable. One hopes, when that Industry arises to find in it firmly established all those firms which have had the pluck and the energy and the foresight to exhibit at this the first *post bellum* Aero Show.

The Air Ministry's Part.

Having thus unburdened one's soul concerning the aeroplane constructors, one desires to refer once more to the Air Ministry exhibits. No visitor to the Show should leave it without making a tour of the galleries. There one finds the difference between the Air Ministry of to-day and the Bolo House of the war. All the Bolos have been cleared out and to-day we are blessed with a number—unfortunately only a small number—of keen and capable practical men who are working strenuously for the progress of aviation.

It was only a fortnight before the Show that the Air Ministry was asked to co-operate in making the affair a success. It has responded nobly. Air Vice-Marshal Ellington's whole Department of Supply and Research has surpassed itself.

The once-execrated Aeronautical Inspection Department, under the personal direction of Wing-Commander Bagnall-Wilde and his chief accomplices Wing-Commander Outram and

Flt.-Lieut. Mansell, have arranged a most convincing show of the methods by which the officials of the Department test, check, measure, gauge, and otherwise manipulate aircraft and aircraft components so as to ensure their being fit not only to use without danger to pilots and passengers, and the Great British Public on the ground, but to uphold the reputation of British manufactured products all over the world.

Similarly, the Department of Research, under Air Commodore Brooke-Popham, has laid itself out to demonstrate how it sets about testing and developing new ideas which are submitted to it or which it evolves from its own inner consciousness. In this section the Royal Aircraft Establishment, under Mr. Sydney Smith, once so ill-beloved as the Royal Aircraft Factory and now one of the greatest helps to the Aircraft Industry, contributes a number of most interesting examples of its work.

It would require several issues of this paper to describe adequately all the tricks and dodges and gadgets and bits and pieces displayed by these Departments. With paper and printing at its present prices one cannot even think about describing these exhibits. One can only advise everybody to go and see for themselves how well the progress of British aircraft design and construction is helped by the Air Ministry as at present constituted, and how well the reputation of British aircraft is safeguarded.

Truly, the technical side of the Air Ministry deserves a special vote of thanks from all concerned with British aviation for the way in which it is advertising at Olympia the excellence of our British Aircraft. Probably in this instance virtue is its own, and only, reward. Those concerned with these exhibits must be feeling uncomfortably virtuous, and so one is promising oneself the pleasure, when the next Show Report Issue of this paper—dealing with the engines and components—has been safely compiled, of spending a happy day in the Gallery of Olympia basking in this atmosphere of virtue and, so to speak, sitting at the feet of the Gamaliels of the Technical Departments.

Airship Efforts.

Naturally it would be somewhat difficult for the Airship Department to do justice to its own particular vehicles, even in the vast barn which is Olympia, so this department has to content itself with models. Yet even the models convey some idea of the work which our hardworking airship officers and officials have done.

The chiefs of the Airship Department have been playing General Post so vigorously of late months that one does not know who is or who is not responsible for this excellent exhibit. But one can, at any rate, give a great deal of the credit to the Lady Sybil Grant, who is the very charming presiding genius of this section of the Show, much as she was of the Kite Balloon Station at Roehampton during the late lamented war.

The Airship Section is very well done. The models are, of course, accurate, and represent all the types of airships used by the R.N.A.S. and R.A.F. Also there are actual cars of the smaller types. And there are numbers of gadgets and instruments and things.

Among the interesting affairs shown is a model of the big Airship Station at Pulham, with all the buildings made, one hopes, to scale. A fact which led the most irresponsible of the staff of The Aeroplane to remark: "Immoral crowd these airship people. Their Y.M.C.A. building is the biggest thing in the place except the airship sheds. Seems as if they want a devil of a lot of reforming." All the same, the model will show some of our aeroplane people what an airship station is like.

Historical Aeroplanes.

Another section of the Show which is well worth a special visit is the Historical Section. This includes all types of war machines and has been arranged by the Aircraft Disposal Co., Ltd., in the Annexe. It ought to be extremely popular with former pilots who desire to show their admiring feminine belongings the comic old contraptions on which they began their war flying, and the beautiful craft on which they finished it.

Also there is much entertainment to be derived from going round this section with one of the early pilots and inducing him to relate how, when, and why he crashed each type in turn. When indulging in this form of amusement it is perhaps as well to forget that one is a taxpayer, and to refrain from doing mental arithmetic concerning what the young gentleman has cost the country. One believes that, reckoning the training establishments only, each war pilot cost about £10,000 to produce, including his crashes in training and omitting his active service crashes.

One hopes that the Aircraft Disposal Company will profit by its enterprise in organising this Historical Section. Mr. Handley Page would be the last person to wish to be accused of disinterested philanthropy, but if the moral and intellectual benefits of this exhibit are divided "fifty-fifty" between his firm and the aeronautical community as a whole one feels sure that he will be pleased.

The Opening of the Show.

The Show opened in the best possible spirit. There was a *morituri te salutant* kind of air about the people in the Industry which was entirely healthy. They had practically been told that they are not going to get any subsidies from the Government and they felt that they were, in the common phrase, "up against it."

The Englishman is never so much at his best as when he is in a fight with his back against the wall, and that is the position of the Aircraft Industry to-day. The people in the Trade have to save the Trade by their own enterprise, and one is confident that they will do so. If one were short-sighted one would like to see the Trade fattening on easily-earned subsidies and filling this paper with advertisements in consequence, but as it is one is prepared to put up a fight along with the rest of the Trade until such time as the Trade and the Trade papers achieve success on account of the intrinsic merits of aviation.

One consequence of the fatalistic attitude of the Trade was that all the heads of the firm seemed to return to the happy days of eight or nine years ago. The prosperity of war and its accompanying responsibility seemed to have fallen from them, and they all seemed that much younger. While the Show was being got ready they visited one another's stands and pulled one another's legs in the good old way that was customary when the Aircraft Industry was a hobby rather than a commercial career.

Once more people seemed to be in aviation for their health rather than for their pockets. Yet one discerned under their gaiety the fixed determination to see the thing through. One feels that Sir Hugh Trenchard's famous "Minority Report" is largely to be thanked for this happy state of affairs. It has been a very wholesome dose of medicine. And one believes that the same hand that administered the medicine will provide in due course, in the shape of orders for new types of machines for the R.A.F., the food which will revive the Aircraft Industry—or, at any rate, such part of it as has proved itself worth reviving.

The Inaugural Ceremonies.

The opening ceremony on Friday was performed by the Marquess of Londonderry, Under-Secretary of State for Air. His subsequent visits to the different stands had rather startling effects. One very clever constructor and designer, accustomed chiefly to our elected legislators, discovered to his surprise that the hereditary legislator, born and trained to the work, has distinct advantages over the mere elected amateur. He said afterwards that he was prepared with all the usual answers which one has ready for the childish questions of the politician. But to his surprise Lord Londonderry did not ask questions. The Under-Secretary for Air came and told him things about his own machines and merely asked to be shown certain points about them of which he had heard but which he had not seen.

People are rather apt to forget that Lord Londonderry is a congenital millionaire who, instead of wasting his substance on riotous living, has himself run his vast estates and mines for some fifteen or twenty years with great success as a business concern, much to the benefit of some thousands of British workpeople. And, moreover, he has held several highly responsible positions under the Government and filled them with outstanding success. The Air Department is very fortunate indeed, both in its Secretary of State and its Under-Secretary.

Lord Londonderry's Views.

At the Inaugural Lunch, after the opening ceremony, Lord Londonderry proposed the toast of the Aircraft Industry and the Exhibition in a plain straightforward speech, of which the worst criticism one heard was that of an official of the S.B.A.C., who said that he wished Lord Londonderry would not refer to aircraft firms as "undertakings"—at any rate, not just at this critical juncture in the history of the Industry.

Lord Londonderry regretted the present unavoidable period of stagnation, and admitted that the Public had not assisted aviation with enthusiasm. He scoffed at the exaggerated newspaper reports of German progress, and said that, instead of there being eighteen German firms devoting themselves to immediate developments, out of nineteen transport companies and thirty factories licensed to carry on air traffic only two are actually working, and of the factories four are engaged on research work and two are designing machines.

He said that he regarded this exhibition as an endeavour to assist a still youthful industry. He would have liked to see more foreign exhibits. He congratulated Mr. White Smith, as Chairman of the S.B.A.C., and a whole-hearted backer and

pioneer of the Industry in its earliest days, on the excellence of the Show and the progress of the Industry.

Mr. White Smith's Reply.

Mr. White Smith, of the Bristol Co., in reply remarked that even the inaugural lunch at the Tower of Babel could not have been of a more international character, for there were present representatives of almost all the countries of the world.

One had noted oneself the variety of uniforms at the opening ceremony and had consequently appreciated the remark of a member of the Industry who said that he wanted to collect the lot and write a musical comedy round them.

Mr. White Smith thanked the Air Ministry for its very splendid exhibit. He expressed his belief that the Ministry would do its best to maintain the designing staffs of the different firms, and he drew attention to the careful study of aeronautical problems which was going on at the N.P.L., the R.A.E., and the Universities. Aerial transport was now a fact and was growing in importance. Finally he appealed to the Press to educate the Public and not merely to confine its attention to "stunts."

Mr. Cary's Tact.

Mr. R. O. Cary, in proposing the Guests, made one of the most graceful speeches ever heard in connection with aviation. Referring to the International aspect of the gathering, he said that FFrance, who was represented there by M. Flandin, had been our first school of aviation, but he hoped that we had partially repaid our debt by sending men and machines to help our teacher in time of trouble. When we sent that force of men to France it had to find a soul, which had to emanate from a personality. Sir Hugh Trenchard had instilled into that force the soul of chivalry. And now Sir Frederick Sykes was making real the dreams of Kipling and Wells. To him thanks were due for the most interesting exhibits of the Air Ministry.

M. Flandin's Views.

M. Flandin, the French Under-Secretary for Air, in replying, quoted Mr. Kipling's inspiring poem on France. He referred graciously to the magnificent organisation of our maritime routes and hoped that we might organise equally well in the air.

He remarked, with truth, that it was fitting that the first regular aerial route should be established between Paris and London. One's enjoyment of M. Flandin's speech was somewhat marred by the noise made by a journalist who had evidently lunched very well.

The Chief's Brevity.

Sir Hugh Trenchard, who successfully and skilfully stymied the Toast-master's effort to announce his uprising, said that he was deeply cognisant of what the Aircraft Industry had done during the war. He did not want anyone to think that the Air Ministry did not recognise the usefulness of Civil Aviation, but it was necessary to keep the Aircraft Industry alive by sound means (not by subsidies).

He hoped to see it equal to the Ship-building Industry—in time. The keenness of pilots and mechanics helped as much as the needs of war to develop the war-time aeroplane. He hoped that the Aircraft Industry would help the Service as much in the future as the pilots and mechanics had helped it in the past.

The C.G.C.A. on the Future.

Sir Frederick Sykes, whose rising was hailed with a would-be humorous remark by the well-lunched journalist to whom one has already referred, said that he was struck by the "practicalness" of the exhibits in the Show. We had conquered the air, and the next step was to exploit our victory. Every country could assist the great civilian flying effort. Aviation was intrinsically international. He referred to the good work done by the Handley Page, Air Transport and Travel, and Instone air lines.

He mentioned that in the first year of civilian flying there had been 39,000 flights, 734,000 miles had been flown, 70,000 passengers had been carried, and only one of them killed. Also 116,500lb. of goods had been carried and 515 machines had been registered for passenger-carrying up to the end of March this year.

In the last three months 1,000 machines had arrived or departed on the Continental air lines, as against 400 in the previous seven months. Sir Frederick Sykes remarked that when he made his first flight, in 1911, the pilot said to him as they left the ground, "Lean forward." [NOTE FOR THE UNINITIATED :—The old box-kites were entirely unstable and generally tail heavy, so a passenger by leaning forward helped materially to trim ship.] He besought all those present to lean forward and help Civil Aviation. He appealed for public interest and support, and he congratulated those present on their enterprise and on their faith in aviation.

The Early Days.

After that the Show was officially open. There was hardly anybody there apart from the Trade on Friday. There was a fairish crowd on Saturday afternoon, but a lamentable scarcity in the evening although the weather was all in favour of indoor amusements.

Possibly the Show Posters may have frightened people away. Neither the lady scratching her head with a banana, nor the other lady partially swathed in red flannel and having her toe-nails pedicured by a propeller, are likely to attract visitors.

To give the Daily Press its due it was very generous to the Show in its advance notices and in its reports on the opening day. Most of the accounts of the Show were intelligently written and free from attempts to be sensational, excepting, of course, certain chronic drivellers. It remains now to be seen whether the Public visits the Show in thousands or merely in hundreds during this week. At any rate it is to be hoped that all who read this paper will go to Olympia if they are within reach, and that they will bring or send their friends. One repeats one's opening statement, that it is a very fine affair. Moreover it is an historical event, in that it is the first occasion on which aerial public service vehicles have been on view for the close inspection of those who will use them in future. It is the duty of all those who are concerned with and for the progress of aviation to do all that they can to help towards the success of this the first British aero show since the war.—C. G. G.

AN INTERESTING EVENT.

The wedding of Air Marshal Sir Hugh Trenchard and the Hon. Mrs. Boyle will take place on Saturday next, July 17th, at 2 p.m., at St. Margaret's, Westminster. It is intimated that there will be no reception after the wedding, but all friends will be welcome at the church.

It is to be presumed that as the church is comparatively small a good many of the said friends will perforce provide a welcome to the distinguished bride and bridegroom outside the church. Such welcome will be of the heartiest.

THE WRIGHT PATENTS AND AN INJUNCTION.

In the New York Law Courts on July 10th, Federal Judge Thomas Chatfield granted a perpetual injunction against the sale or use in the United States of America of any foreign-built machines embodying features which are an infringement of the Wright patents. The injunction was granted to the Wright Aeronautical Corporation of Paterson, New Jersey, in a suit against the Inter-Allied Corporation of New York—an offshoot of Handley Page, Ltd.

A similar action is to be opened against the Aerial Transport Corporation of Delaware, a company formed recently to supply surplus British aircraft in an aerial service between Chicago and New York.

This injunction would appear to be effective against all aircraft the maintenance of lateral stability in which is by means of warping wings or any form of horizontal ailerons.

MR. GEOFFREY WATSON'S PICTURES.

One knows of perhaps two artists who can both draw an aeroplane accurately as to type and also embody it into a picture so that it actually appears to be flying and not merely stuck in accidentally. One of these two artists is Mr. Geoffrey Watson, who is exhibiting some of his pictures at the Brook Street Art Gallery. As the entire proceeds of this exhibition are to go to the Royal Air Force Memorial Fund, it is hoped that many people will pay a visit to the exhibition, which remains open until next Wednesday.

And a visit is well worth while. Perhaps the most interesting picture is No. 29, "A Stern Chase," which depicts an S.E.5a contour chasing through Houlthulst Forest, with a flock of "Dv" Albatros after him. One liked the Albatros which was disintegrating on a tree stump. Other specially good pictures were No. 21, "The Death of Lieut. Voss"; No. 2, "On Their Tails"; No. 6, "The Red Baron"; No. 14, "Armistice Day Over Salisbury Plain"; and No. 43, showing a homely scene at a training aerodrome.

There are also one or two oil-paintings, a particularly striking example of these being that of the Transatlantic Vickers-Vimy above the clouds in a darkening sky.

Mr. Geoffrey Watson deserves every congratulation both on the pictures and the sporting way in which he is helping the Fund.—G. D.

ON THE NAVY'S WAY WITH THE R.A.F.

None can accuse one of having been unduly enthusiastic when the R.N.A.S. was taken away from the Navy and mixed with the R.A.F. On the other hand, none can accuse one of being unduly enthusiastic about the intelligence or even the ordinary common sense of the Navy. Therefore one claims to be a strictly neutral observer when one makes the plain statement that sooner or later—and the sooner the better—the King's aircraft-carrying ships must be taken away from the Navy and manned, commanded and navigated wholly and solely by R.A.F. personnel.

The reason is, to put it perfectly plainly and bluntly, that R.A.F. personnel and material are much too valuable to be messed about (to use a vulgarism which exactly expresses itself) by a crowd of hidebound, unintelligent, uneducated, unprogressive, self-centred, self-satisfied, self-conceited Naval officers who have been, as the American language has it, "dead from the eyes upward" ever since their thirteenth year or so when they became the raw material for quantity-production at Dartmouth or Osborne.

Naturally the aircraft-carriers of the R.A.F. will co-operate with the ships of the Navy when necessary, just as the land-going squadrons of the R.A.F. co-operate with the Army when necessary. But there is no more real reason why the aircraft-carriers should be owned, manned and navigated by the Navy than that the aerodromes of the R.A.F. should be owned by the Army or that the transport of the R.A.F. should be owned and handled by the Royal Army Service Corps. For, after all, what is an aircraft carrier other than a floating aerodrome?

The Proof of the Pudding.

It is not one's custom in this paper to make statements unsupported by evidence, and the proof of the pudding is in the eating. Therefore it is well to give definite proof of the kind of pudding, or rather the mess of red pottage, which the Navy has made for the R.A.F. and for which the Naval side of the R.A.F. has sold its birthright as a free and independent Air Force.

Early this year H.M.S. *Ark Royal,* aircraft-carrier, was sent to the Marmora to impress the Turk with our power in the air. There the R.A.F. personnel did good work, though at what seems to have been unnecessary risk in proportion to the matter at issue. Float seaplanes with 260-h.p. engines were sent 60 miles inland over the big mountains of Asia Minor, much as in 1915 seaplanes with 220 h.p. were sent a hundred miles inland over the smaller mountains of Palestine. As in the Palestine affair the pilots had to fly up valleys because the mountain tops were above the ceiling of the machines.

It will be remembered that General Seely and others were demanding from the comfortable benches of the House of Commons that the R.A.F. should bomb the Turks to save the Armenians. One asks whether the end justified the means. Evidently the Navy, which controls operations by the R.A.F. personnel of aircraft-carriers, thought so whatever may have been the views of the R.A.F.

Thereafter *Ark Royal* was sent to the Caucasian coast of the Black Sea to help in the evacuation of that coast by Denikin's defeated partisans. This again involved scouting operations by big seaplanes with floats for miles inland over forests and hills.

After a week or so of this the ship was ordered by the Navy to take several hundreds of sick and wounded, together with some women and children, from the Caucasus to the Crimea. Among them were a hundred cases of typhus fever in various stages. The officers naturally gave up their cabins to the women, and the workshops were handed over to the doctors for their own mechanical operations.

None can complain that *Ark Royal* was used on this mission of mercy, but as these refugees were reeking with disease and vermin one would at least have expected even the Naval authorities to have had the ship cleansed and disinfected after this trip. Such precautions are, however, apparently beyond the Naval intelligence, for the ship was dispatched to the East again to pick up Denikin's supporter "General" Scurio and the remains of his mounted bands known as "Scurio's Wolves." Between a thousand and two thousand of these people were crammed on board and were transported to a safe place in the Crimea.

These people also were diseased and verminous. Nevertheless, without a halt *Ark Royal* was sent to Batoum. On the way cases of typhus appeared among the crew, as the natural result of carrying these refugees—who presumably were dumped onto Ark Royal by some intelligent Naval official on the grounds that they were "flying people."

Then, and not till then, *Ark Royal* was seriously considered by the Navy as a plague spot. She was ordered to Constantinople, where she landed eight of her crew who were down with typhus, in addition to the first man who developed the disease and who had been landed at Batoum.

The True Naval Touch.

Then came the crowning imbecility of the Naval administration. The ship was sent to the Gulf of Ismid so that the crew might go into quarantine. Officers and men were shaved, sprayed with disinfectants, put overside with tents and bedding, and ordered to make themselves a quarantine camp on an indicated spot, a filthy-looking piece of ground.

No floor-boards were provided, so the men had to put their beds on ground-sheets and the officers put theirs on the ground. In the night people woke up to scratch themselves, and in the morning human hair was found about the ground, alive with lice. The personnel of *Ark Royal* had been ordered to pitch their camp on the site of a former Russian refugee camp.

The camp was moved that day to clean ground, and there the people of *Ark Royal* spent three weeks, without being allowed to fetch any of their belongings from the ship.

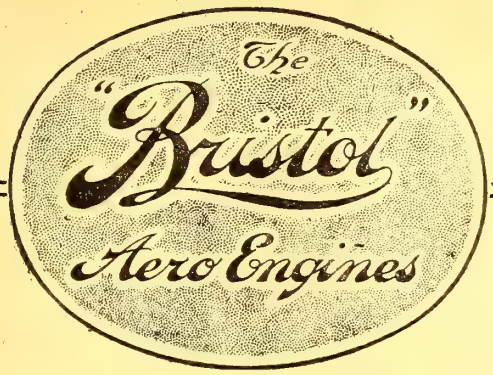
All told, *Ark Royal* had twenty-four cases of typhus, three of which, together with one case of small-pox, developed in the quarantine camp. One officer and one C.P.O. died, but with a certain poetic justice neither of them belonged to the R.A.F.

One is also told that during the whole period the R.A.F.'s own doctor was not allowed to do anything, the sick personnel being in charge of a regular R.N. doctor. One casts no reflections on this gentleman, who, of course, did his best, and was no doubt very successful, in that only two deaths occurred. But one would like to know why, when he was so overwhelmed with work, the R.A.F. doctor was not allowed to take over at least half of the medical duty.

The whole of this case deserves the close attention of the Air Council and of their Lordships of the Admiralty. It is at any rate authentic, and it seems on the face of it to be a pretty damning indictment of the way of the Navy with the R.A.F.

The General Aspect.

Quite apart from this particular example of Naval ineptitude there are excellent reasons for wishing to separate the efficient R.A.F. from its inefficient Senior Service. The R.A.F. officer's life on board a Naval ship is



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JUPITER (ungeared)	9 „	450 h.p.	698 „	„
JUPITER (geared)	9 „	450 h.p.	805 „	„

Examples of these engines, which will be known in future as

THE

"Bristol"

AERO ENGINES

may be inspected at the

AERO EXHIBITION

on

STAND 58

even worse than that of a Marine. And when R.A.F. other ranks are not engaged on actual aeroplane work they are at the beck and call of any Naval officer

On the other hand, Naval ratings are used in handling aeroplanes on board and in getting them over-side. This, as might be expected by anyone who knows the heavy-handed methods of the ordinary matlow, frequently has dire results which are very expensive to the taxpayer. The delirious pictures by Mr. Beuttler which have appeared from time to time in the *Bystander* are much nearer being photographs than caricatures when the Navy starts to handle aeroplanes regardless of the contemned advice of the R.A.F.

Happily the R.A.F. on board ships are developing as strong an *esprit de corps* as is the R.A.F. ashore, and so it is prevented from being disheartened by the ways of the Navy. Already the R.A.F. regards itself very rightly as the superior service, on the good old principle that "To have *been* first merely proves antiquity, to have *become* first proves merit."

Consequently the work of the R.A.F. on board ship is well done. But anybody who studies the question at all intelligently must be convinced that, sooner or later, the R.A.F. must own and operate its floating aerodromes just as it owns and operates its areodromes ashore.

C. G. G.

SIX MONTHS OF CIVIL AVIATION—II.

THE DOMINIONS, INDIA, AND THE COLONIES.

Arrangements are being made to secure "the greatest possible measure of uniformity" between Air Regulations of each unit of the Empire. The "Air Navigation Bill provides for the adaptation by Order in Council to British Possessions, exclusive of the self-governing Dominions and India, of the legislation in force in this country." India and Canada have formed Air Boards and have published Air Regulations.

The Colonial Office, the India Office, and the Foreign Office (for Egypt) are working with the Air Ministry to effect interchanges of opinion between the Dominions and Colonies and Great Britain.

In Australia an "Air Services Committee" deals with aviation questions. The administration of Civil Aviation is now under consideration. A gift of one hundred aeroplanes has been accepted from the British Government.

The Canadian Air Board Act was passed in January, 1919, of from five to seven members appointed by the Governor in Council. The duties of the Board resemble those of the Air Council in Great Britain. A Superintendent of Flying Operations, with a seat on the Board, "controls the licensing of personnel, aircraft, and air harbours, and is responsible for Civil Aviation conducted by private enterprise."

An Associate Air Research Committee, formed under the Honorary Advisory Council for Scientific and Industrial Research, began its sittings on Feb. 7th, and is in close co-operation with the Board.

Dangerous flying was prohibited by Order in Council on July 7th, and Civil Aviation Regulations were issued on Jan. 17th last.

Experiments in photo-topographical surveying have been authorised in the Province of Quebec.

In India Civil Aviation is again free from the official ban, and an advisory Air Board has been formed under the Department of Commerce and Industry.

Under the Indian Aircraft Act of 1911 the Governor-General in Council had drawn up Air Regulations which are now in operation.

The Governor-General of New Zealand is empowered under the Aviation Act of 1919 (passed December, 1918) to make Air Regulations.

Civil Aviation in South Africa is temporarily controlled by the Department of Railways and Harbours. A conference was held on Jan. 25th to consider suitable methods for developing civil aviation, and the Government has the matter under consideration. The Government has offered to maintain the aerodromes on the Cape-Cairo route situated within its territory.

The Legislature of the Bahamas has passed a Bill provisionally regulating air navigation, and has had under consideration the grant of concessions to a company undertaking an air mail service between the islands and with Florida.

COMMERCIAL SERVICES.

Two Aerial Mail Services are now in existence—the London-Paris and the London-Holland (this latter is naturally not referred to in the paper as being in operation).

In the table of flights shown below "it will be seen that the average length of flights has increased from slightly over 12 min. in the first five months of civil aviation to 28 min. during the six months under review, showing that the increase is mainly in real commercial traffic rather than in instructional and propaganda flights, so largely carried on during the summer.

"From Aug. 26th, 1919, to March 31st, 1920, goods to the value of £209,358 were carried by the Continental Services, £136,116 representing Imports and £73,242 Exports. Of this, £7,644 represented dutiable goods. Clothing of various descriptions formed the principal item in both Imports and Exports. Imports also included watches and cinematograph films; Exports: precious metals, cinematograph films, drugs and perfumery."

The following tables are self-explanatory:—

BRITISH CIVIL AVIATION, INCLUDING CONTINENTAL TRAFFIC.†

May 1st, 1919, to March 31st, 1920.

—	May to Sept. 5 months	Oct. to Dec. 3 months	January	February	March	Jan. to March 3 months	Oct. to March 6 months	May to March 11 months
Number of machine flights made	31,250	4,170	542	637	1,222	2,401	6,571	37,821
Number of machine hours flown	6,566	1,852	309	333	567	1,209	3,061	9,627
Average duration of each flight in min.	12	26	34	31	28	30	28	15
Approximate machine mileage	460,285	137,964	21,671	26,400	45,539	93,610	231,574	691,859
Number of passengers carried	58,132	6,284	793	931	1,800	3,524	9,808	67,940
Approximate number of hours flown by passengers	13,803	2,697	318	466	812	1,596	4,293	18,096
Weight of goods carried in lb.	45,130	22,013	2,644	7,935	25,056	35,635	57,648	102,778

DEPARTURE AND ARRIVAL OF AIRCRAFT TO AND FROM THE CONTINENT.

—	Aug.§ 26th 31st		Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Total	
	Dep	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.	Dep.	Arr.
British	9	8	68	64	84	80	54	39	33	28	44	33	44	38	65	63	401	353
French	—	—	6	7	15	15	8	10	2	1	4	4	7	6	24	24	66	67
Belgian	—	—	—	—	—	—	—	—	—	—	—	—	2	3	1	1	3	4
Swiss	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1
Other States	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	9	8	74	71	99	95	62	49	35	29	48	37	53	47	91	89	471	425

Total for August and September, dep. 83, arr. 79; for three months, October-December, 1919, dep. 196, arr. 173; for three months, January-March, 1920, dep. 192, arr. 173

† These figures, which have been supplied voluntarily by the firms concerned, do not include competition flights from England to Australia or Cairo to the Cape.

§ Aug. 26th, 1919, was the date upon which international civil flying first began.

VALUE OF GOODS IMPORTED AND EXPORTED INTO AND FROM THE UNITED KINGDOM.

Period	Imports (Free) from—			Imports (Dutiable) from—				British Exports to—			
	Netherlands	Belgium	France	Netherlands	Belgium	France	Italy	Re-exports to France	Netherlands	Belgium	France	Italy
1919—												
Aug.	—	—	—	—	—	1	—	—	—	—	12	—
Sept.	—	—	4,425	—	—	75	—	844	—	—	2,146	—
Oct.	—	22	23,389	—	—	509	6	1,201	—	—	7,270	1
Nov.	—	9	18,009	1	—	2,132	—	584	—	7,376	6,555	—
Dec.	—	145	10,398	—	2	716	—	615	—	2,206	2,287	—
1920—												
Jan.	—	—	8,188	—	—	1,687	—	1,309	—	—	1,327	—
Feb.	—	—	17,721	—	5	1,101	—	8,651	—	1	5,126	—
Mar.	470	208	45,488	—	—	1,409	—	12,528	3,497	—	6,706*	—
	470	384	127,618	1	7	7,630	6	25,732	3,497	9,583	31,429	1
	128,472			7,644				70,242				

* In addition, diamonds to the value of £3,000 were exported to France in March.

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ACCIDENTS.

—	May to Sept. 1919 5 months	Oct to Dec. 1919 3 months	Jan. to March 1920 3 months	Oct. 1919 to March 1920. 6 months	May 1919 to March 1920. 11 months
Number of accidents resulting in death to one or more occupants of machine	2	2	—	2	4
Number of non-fatal accidents resulting in injury to occupants of machine	8	—	3	3	11
Number of accidents resulting in death of third party (occupants of machine uninjured)	1	—	—	—	1
Number of accidents in which no one was killed or injured	2	3	3	6	8
Total accidents reported	13	5	6	11	24
Approximate number of machine miles flown per accident	35,406	27,593	15,601	21,052	28,827
Approximate number of machine flights per accident	2,404	834	400	597	1,576
Approximate number of machine hours flown per accident	505	370	201	278	401
Pilots killed	2	2	—	2	4
Pilots injured	6	—	3	3	9
Passengers killed	—	1	—	1	1
Passengers injured	10	—	2	2	12
Third party killed	1	—	—	—	1
Pilots killed per 1,000 flights made by pilots	0.06	0.48	—	0.30	0.106
Pilots injured per 1,000 flights made by pilots	0.19	—	1.23	0.45	0.238
Pilots killed per 1,000 hours flown by pilots	0.31	1.08	—	0.65	0.415
Pilots injured per 1,000 hours flown by pilots	0.92	—	2.48	0.98	0.934
Passengers killed per 1,000 passengers carried	—	0.16	—	0.10	0.015
Passengers injured per 1,000 passengers carried	0.17	—	0.57	0.20	0.176
Passengers killed per 1,000 hours flown by passengers	—	0.37	—	0.23	0.055
Passengers injured per 1,000 hours flown by passengers	0.72	—	1.25	0.46	0.663

The above figures do not include competitive flights from England to Australia or Cairo to the Cape.

LICENCES.

During the six months under review the following licences and certificates have been granted :—

		Total issued since May 1st, 1919.
Licences for pilots	163	484
Licences for pilots (renewals)	129	129
Licences for ground engineers	113	345
Licences for engineers	1	1
Licences for navigators	3	4
Licences for aerodromes	36	119
Licences for aerodromes (renewals)	12	12
Certificates of registration	127	474
Certificates of airworthiness	107	325

The effect of the winter months is noticeable in these figures, though they show a definite, if small, development.

INSURANCE.

"Lloyd's have decided to undertake the systematic collection of information for purposes of aviation insurance, and the information collected will be circulated to their members in a confidential record." They have copied the register of aircraft certificates and have masses of other information. Lloyd's will put themselves in touch with aircraft owners and constructors and licensees of aerodromes in regard to further information. It is hoped that Lloyd's interest will cause the establishment of a sound system of aviation insurance.

INFORMATION, DISPOSAL OF AIRCRAFT, COMPETITION AND EXPENDITURE.

Reference is made to these three subjects, but the information given is common knowledge.

RESEARCH.

The Research Department and the Civil Aviation Department have in collaboration produced new types of recording instruments for the Air Ministry Competitions. The development of turn indicators is proceeding satisfactorily.

"The development of the R.A.E. sextant, the aperiodic compass, bearing plates and navigational flares for use at sea facilitate the methods of checking dead reckoning for air navigation."

This concludes the section dealing with the British Isles.

FOREIGN COUNTRIES.

Part II is set aside for compressed descriptions of the official progress of aeronautics in foreign countries, the lack of detail giving a grandiose air to the whole.

In general it is stated that the International Air Convention has now been signed by all the Allied and Associated Powers.

Article 5 of the Convention, forbidding the passage of aircraft of non-contracting States over the territory of contracting States, disturbed neutral States who thus became cut off from aerial communication with the late enemy States.

A Protocol has in consequence been drawn up under which States may sign the Air Convention and yet be free from such conditions as would prevent their communication by air with former enemy countries.

AUSTRIA.

An Aviation Department has been formed in the Ministry of Transport. Provisional Air Regulations were issued on Dec. 10th, 1919.

The Luftfahrwesen Gesellschaft ("Lufag") has bought up all service aircraft and will give 60 per cent. of the excess over valuation price to the State.

BELGIUM.

An autonomous Department of Aviation, temporarily attached to the Ministry of War, has been created.

Air Regulations were published on Nov. 27th, 1919.

Air Attachés have been appointed in London and Paris.

Civil aviation is carried on almost entirely by the Syndicat National pour l'Etude des Transports Aérien (known as S.N.E.T.A.), organised by Belgian bankers. They give facilities on organised air routes to civil aviation companies at fixed charges. In February, 34,000 fcs. was received for passenger flights, and the total expenditure was 20,000 fcs.

The Government has given the Syndicate 2,000,000 fcs. to organise a flying-boat and hydro-glissour service on the Congo.

SCANDINAVIA AND FINLAND.

Conferences have been held between representatives of Denmark, Norway, Sweden, and Finland for the examination of the International Air Convention with a view to the drafting of suitable air regulations.

In Denmark and Norway, commissions under Ministers of Public Works and War are studying aeronautics. In Sweden the Ministry of the Interior effects legislation in aviation matters.

The formation of a Civil Air Department in Denmark is considered premature, and the Ministry of Public Works is organising civil aviation. A State Aviation Board will deal with technical questions, control flying schools, and assist naval and military aviation (when requested).

An air transport insurance pool, composed of a combine of about eighty Danish, Norwegian, Swedish and Finnish insurance companies, has been formed. The pool is arranging the registration of aircraft throughout Scandinavia.

No regular aerial services have started as yet. The Norske Luftfartrederei intends to open a number of routes in Norway, and has received a Government subsidy of £3,800 (instead of £16,000 asked for of the Government).

FRANCE.

Since January 30, 1920, the Organe de Co-ordination Général de l'Aéronautique has been transferred from the Ministry of War to the Ministry of Public Works under a Sous-Secretaire d'Etat pour l'Aéronautique. He (the latter) is responsible for the Air Navigation, Technical, Aircraft Production and Meteorological Departments. A Technical Consultative Committee has also been formed.

There is an Air Attaché in London and Assistant Military Attachés for aviation duties in Washington, Stockholm, Brussels, Rome and Amsterdam. Missions have been sent to Argentina, Brazil, Japan, Peru, Poland, Finland, Serbia, Czecho-Slovakia and Turkey.

Subsidies based on the value of the machine and engine and number of hours flown, with a bonus to the crew, a premium on useful load and speed, and 25 per cent. additional grant to machines of military value are given by the Government to commercial aircraft.

In addition the Post Office gives to mail aeroplanes 8 francs for the first 100 grammes and 1.60 francs for every additional 20 grammes of letters carried.

The State has five aerodromes and 24 landing grounds for civil use. Of these 18 aerodromes have yet to be equipped. Thirteen military aerodromes may be used by Civil Aircraft.

The Consortium des Assurances Aériennes has drawn up a list of insurance tariffs.

Since Sept., 1919, a Toulouse-Rabat aerial service has been maintained by the Compagnie de Navigation Aérienne (M. Latecoere). A Nîmes-Nice service is run bi-weekly by the Compagnie Aérienne Française. The Société Anonyme des Transportes Aéronautiques du Sud Ouest has been reformed as the Compania Franco-Bilbania des Transportes Aeronautico to open a service between Bayonne, San Sebastian, Bilbao and Santander, "by which it is hoped to carry mails from Bilbao to connect with the Paris express at Bayonne and, in the case of English mails, secure delivery in London on the following day by arrangement with the Paris-London air service."

There is a large rigid airship shed at Pierrefeu near Marseilles available for civil airships.

(To be continued.)

THE PIONEERS' DINNER.

The dinner organised by Benn Brothers, Ltd., the proprietors of *Aeronautics*, for the survivors of the first hundred British pilots, the pioneers of aviation, and sundry friends of the firm, took place as advertised on July 12th. The gathering was very representative of the early days of aviation and of the present-day British Aircraft Industry. His Royal Highness the Duke of York honoured the gathering with his presence, and the Chair was taken by Major-General J. E. B. Seely.

The idea of a dinner to the pioneers of aviation was started in the Royal Aero Club by some person or persons unknown. A Sub-Committee was formed to decide who was and who was not a pioneer, and a list of names was submitted to the Main Committee of the Club. The said Committee turned down the scheme, chiefly because they, very wisely, funked the responsibility of making invidious distinctions. The guests at the dinner on Monday included all the Aero Club list and sundry others. Major C. C. Turner, the editor of *Aeronautics*, who was, along with oneself, a member of the original Pioneers' Sub-Committee of the Royal Aero Club, is to be congratulated on having induced his proprietors to undertake a task which one considered oneself after the Club had turned it down and funked for the Aero Club's reason, namely, that selection would make for one more enemies than friends—not that one is afraid of making enemies, but one hates making enemies of the wrong people.

Some two hundred and fifty guests accepted Messrs. Benn's invitation, of whom about forty-five were in the first hundred pilots, and some sixty or so more were among the genuine pioneers, such as the people who wrote the first reports of aviation meetings, the people who started the first aviation papers, the people who supplied the first oil to aero-engines, the people who first insured aeroplanes, and others who, like oneself, have assisted from a safe place on the ground to put others into the air. The rest may be classed as "also ran."

The pioneers were all very pleased to see one another, and would have spent the evening cheerfully in conversation. But, owing to the multitude of speeches, there was little opportunity for talking. Evidently the indomitable patience which is a necessary component of the pioneer has survived the intervening years, for the pioneers bore the speeches as unflinchingly as they bore the buffeting of fate in the past.

Being located at the outer fringe of the assembly, with the breeze against the speakers, one was unable to hear most of the speeches and so can only record impressions.

The Duke of York expressed his admiration of the pioneers and regretted the lack of encouragement they had received. Lord Desborough was inaudible. Captain Wedgwood Benn was quite clever and made some very good jokes, judging by the laughter. Lieut.-Colonel Moore-Brabazon boldly proclaimed that though all sorts of people had been given titles for alleged services to aviation, not one of the real pioneers had received any honour worth having, except Sir Frederick Sykes, and he had got his for military work.

Sir Frederick Sykes made one of his usual graceful speeches. Lord Burnham spoke with rapidity. Commandant Sablé, the French Air Attaché, made a speech in French in which the word *fraternelle* occurred. Major Melvin Hall, the U.S. Air Attaché told a couple of quite funny nigger stories.

Mr. J. L. Garvin demonstrated that he had not lost his Dublin accent. Mr. Wells talked Bolshevism-and-Soda, remarking that Europe, as chopped up at present, is too small for international aviation, and suggesting that the United States of Europe, under a League of Nations, would solve the difficulties. He said that aviation will gain nothing from war.

Mr. Wells, like that other minor prophet Habakkuk, seems *capable de tout*. But people are apt to forget that when one examines his so-called air prophecies in detail they are mostly hot air. He is invariably wrong in his practical details. As usual he omitted the interesting practical detail that a unified Europe may be achieved by conquest even better than by a League of Nations. And whether that conquest is achieved by the Slavs or by the Teutonic peoples depends largely on the development of military and naval aircraft by German and English and French aeronautical engineers. If we adopt the advice of Mr. Wells and his fellow-doctrinaires the Slavs will win.

Lord Montagu made a commendably brief speech, and Lord Londonderry, as is his habit, talked sound sense for a very few minutes. General Seely, who is one of the most charming of men when out of his political harness, said very little.

Messrs. Benn Brothers are to be congratulated on their enterprise and pluck in organising the gathering, and one regrets to find that the daily Press has failed to give them and their entirely amiable journal *Aeronautics* the advertisement which they deserve.—C. G. G.

The names on the programme were as follow :--

Acland, Capt. P.D.; Adams, E. R.; Aldworth, C. H. J.; Allen, Chas. V.; Aston, Capt. W. G.; Austin, Sir Herbert.

Bacon, Miss Gertrude; Baden-Powell, Maj. B.; Bagnall Wild, Air Com. R. K.; Bairstow, Prof. L.; Barber, Horatio; Brewer, Griffith; Barnwell, F. S.; Barr, A. J. A. Wallace; Benn, E. J. P.; Benn, Capt. Wedgwood; Bewsher, J. P. H.; Bird, Squadron-Com. J.; Blackburn, Wing-Commander H.; Blackburn, R.; Blake, Major Wilfred T.; Blumenfeld, R.; Board, Wing-Commander A. G.; Bouwens, B. G.; Boyle, Capt. the Hon. Alan R.; Brackley, Major H. G.; Bradshaw, Granville; Brand, Flt.-Lieut. Sir Quintin; Bright, Sir Charles; Broke-Smith, Lieut.-Col. P.; Brooke-Popham, Air-Commodore H. R. M.; Broome, Capt, F. C.; Buck, Major F. C.; Burnham, The Rt. Hon. Visct.; Buist, H. Massac; Busteed, Wing-Commander H. R.; Butler, Frank Hedges.

Caddell, Brig.-Gen. W. H.; Calthrop, E. R.; Cary, R. O.; Cates, John; Cattle, A. J.; Chalmers Mitchell, Dr.; Charteris, Captain R. L.; Chereau, M. Norbert; Clarke, T. W. K.; Clayton-Kennedy, Major K. E.; Clerke, Major A. B. H.; Cochrane, William; Cockerell, Captain S.; Coghlan, Sir T. A.; Conway Jenkins, Brig.-Gen. F.; Cook, Sir Theodore; Coppens, Chevalier Willy; Crole-Rees, H. B.; Currie, Sir James.

Dale, Martin; Darroch, G. R. S.; Davenport, Arthur; Davidson, G. L. O.; Davies, Keith E., Dawes, Wing.-Com. G. W. P.; De Havilland, Capt. G.; Delacombe, Lieut.-Col. H.; Desborough, The Rt. Hon. Lord; Dolphin, Flt.-Lieut. W.; Douglas, John; Drexel, J. A.; Duffy, A. E.; Dunne, J. W.

Ewen, Major W. H.

Fairey, C. R.; Fisher, Frank; Flanders, L. Howard; Fowler, Major F. B.; Fox, Chester; Frost, Edward P.

Garvin, J. L.; George, A. E.; Glazebrook, Sir R. T.; Gnosspelius, Major O. T.; Gordon-England, E. C.; Grahame-White, Claude; Graziani, Major Carlo; Green, G.; Greenhill, C. G.; Greig, Wing-Commander L. L.; Greswell, C. H.; Grey, C. G.; Grey, Lieut.-Col. Spenser.

Hadfield, Sir Robert, Bart.; Hall, Major Melvin; Hamer, F. E.; Hammond, E. V.; Handasyde, G. H.; Harbord, The Hon. Mrs. Assheton; Hawker, H. G.; Heckstall Smith, Major S.; Hewlett, Mrs. Maurice; Higgins, Group-Capt., T. C. R.; Higgins, Air Vice-Marshal J. F. A.; Hubbard, Squad.-Com. T. O'B.; Huggins, Brig.-Gen. A.; Hughes, C. E.; Hynes, Wing-Com. A.

Isaac, Bernard; Isaacs, Godfrey; Itami, Major-Gen. Matsuo.

Johnson, Basil; Joynson-Hicks, Sir Wm., Bart., M.P.; Jullerot, Major H.

Kemp, Ronald C.; Kerr, Rear-Admiral Mark, Knox, Henry.

Lang, A. Dashwood; Lee of Fareham, Lord; Leslie, Flight-Lieut. Reginald; Ledeboer, Major J. H.; Lloyd, Colonel F. Lindsay; Lloyd, Herbert; Londonderry, The Most Hon. The Marquess of, K.G.; Longcroft, Air-Commodore C.; Longmore, Group-Captain A.; Lorraine, Lieut.-Colonel Robert; Lord, John; Low, Major A. R.

McCann, G.; McClean, Lt.-Col. F. K.; Macfie, Robert F.; Maitland, Air Commodore E. M.; Mander, Lionel H.; Manning, W. O.; Marlowe, Thomas; Martin, H. P.; Marsh, Lt.-Col. W. Lockwood; May, Fred; Merriam, Capt. F.; Montagu of Beaulieu, The Right Hon. Lord; Moore-Brabazon, Lt.-Col. J. T. C.; Morris, Lord; Mort, J. Chester; Morison, Capt. O. C.

Noel, M. Louis; North, John D.

Ogilvie, Lieut.-Col. Alec; O'Gorman, Lt.-Col. Mervyn.

Page, F. Handley; Paine, Air-Marshal Sir Godfrey; Parrott, R. J.; Paterson, C. Compton; Pepper, Major J. W.; Percival, N. S.; Perrin, Harold E.; Petavel, Sir John E.; Petre, Major H.; Pixton, Capt. Cecil Howard; Prestwich, J. A.

Raper, A. Baldwin, M.P.; Raynham, F. P.; Reynolds, Major H.R.P.; Richards, Geo. Tilghman; Roe, A. V.; Roe, H. V.; Roger, Sir Alexander; Rolls, Capt. Sir John Shelley, Bart.; Ruck, Major-General Sir R. M.

Salmond, Air Vice-Marshal Sir John M.; Samson, Group-Captain C. R.; Sassoon, Capt. E. V.; Sablé, Commandant; Savage, Major J.; Sayers, Capt. W. H.; Scott, Group-Captain A. J. C.; Scott-Paine, Hubert; Scott, C. J. Fairfax, M.A.; Searight, Major T. P.; Sebag-Montefiore, Major T. H.; Seely, Major-General The Rt. Hon. J. E. B.; Selfridge, Mr. Gordon; Seymour, Admiral of the Fleet Sir E. H.; Shapland, H. P.; Shaw, Capt. W. R. Douglas; Shaw, Sir Napier, Short, Eustace; Short, Oswald; Sigrist, A.; Singer, Sir Mortimer; Sippe, Major S. V.; Smith, Lt.-Col. Sydney E.; Somerset, Somers; Sopwith, T. O. M.; Solbert, Col. O. N. (U.S.A. Embassy); Spencer, Herbert; Spooner, Stanley; Spottiswoode, J. H.; Stanton, Dr. T. E.; Starke, E. E.; Stevenson, B.; Stone, Geoffrey de Holden; Swinton, Brig.-Gen. E. D.; Sydenham of Combe, Lord; Sykes, Major-Gen. Sir F. H.

Templer, Colonel James; Thomas, Herbert J.; Thomas, G. Holt; Thorburn, Douglas W.; Thurston, Capt. A. P.; Travers, Squad.-Leader J. L.; Trenchard, Air-Marshal Sir Hugh M., Bart.; Turner, Major C. C.; Turner, Lewis F.; Tutin, J. B.

Volk, M. H.; Vyvyan, Air Vice-Marshal.

Wakefield, Sir C., Bart.; Wallace, R. W.; Walmsley, R. Mullineux; Waring, Sir Samuel J.; Watkins, Capt. H. E.; Weir, Brig.-Gen. J. G.; Welfare, W. T.; Wells, H. G.; White, Sir Stanley; White-Smith, H.; Whittaker, Major W. E. de B.; Wickham, R. F. E.; Wildeblood, Capt. H. E.; Willows, E. T.; Windham, Lt.-Com. W., R.N.; Wright, Howard T.; Woodfine, T. J.

York, H.R.H. The Duke of, K.G.

NAVAL AND MILITARY AERONAUTICS.

[The R.A.F. Appointments have been unavoidably held over until next week.]

NAVAL.

ADMIRALTY APPOINTMENTS.

The following appointment has been made:—

July 9th.—Capt.—A. J. B. Stirling, C.B., to *Argus*, in command, July 31st.

MOVEMENTS OF SHIPS.

Greenock, July 7th.—*Argus* (in company with other vessels) arrived

Naval Officers and the R.A.F.

The Admiralty are asking officers who have passed for lieutenant and are in possession of watch-keeping certificates, to apply to be seconded to the Royal Air Force for a period of three years. For the main part of this service the selected officers will be employed in naval aviation ashore and with the Fleet. Such officers will receive the grading of Flying Officer at the beginning of the seconding period, though should they be of higher naval rank than sub-lieutenant they will be granted corresponding honorary rank in the R.A.F. When they are fully qualified as pilots they will be eligible for promotion to Flight Lieutenant (by selection when vacancies arise).

The permission of the Air Council is necessary before any of these officers can return to the Navy should they desire to do so before the expiration of the term for which they are seconded. The Air Council may, however, should they weary of an officer's habits or manners, return him gracefully to the service whence he came.

If any of these officers, aspiring to a higher life, should wish to obtain a permanent commission in the R.A.F., the Air Council, if they approve, will propose the move to the Admiralty.

Officers lent to the R.A.F. under this scheme must appear before the special aviation medical board.

They will, during their term of seconded service, wear the service dress of the R.A.F. and the mess dress and full dress of the Royal Navy.

AIR FORCE.

A Fatal Accident at Cologne.

On July 5th Flying Officer Alexander T. Macqueen, R.A.F., of No. 12 Squadron, was killed while flying at Cologne. Mr. Macqueen, who was shortly to have been demobilised, served as an officer on a P. and O. boat in the early days of the war. On one occasion when the ship was attacked by a submarine, he was in charge of the gun which sunk the enemy vessel.

The Gottingen Prisoners' Camp.

In order to trace an officer whose name is still scheduled as "Missing," would officers and men who were prisoners of war at Göttingen in 1916 please communicate with C. G. Jenyns, Services Club, Stratford Place, W.?

The R.A.F. Memorial Fund Ball.

On July 8th a ball in aid of the R.A.F. Memorial Fund was given at the Ritz Hotel. Among those present were H.M. the King of Spain, H.R.H. the Duke of York, K.G., the Princess Louise, Duchess of Argyll, the Marquess and Marchioness of Londonderry, Air Marshal Sir Hugh Trenchard, Bt., Air Vice-Marshal Sir J. M. Salmond, K.C.B., Dame Helen Gwynne Vaughan, and Air Vice-Marshal Vyvyan. About 600 dancers took part therein. Several dinner parties were given.

Athletics in the R.A.F.

On Saturday, July 17th, the contest for the Athletic Championship of the R.A.F. will be held at Queen's Club. A cup for the best all-round team has been presented by H.M. the King, and small replicas of the cup have been given by the Marquess of Londonderry, K.G., the Earl of Rocksavage, Sir Charles Wakefield, Bart., Sir Phillip Sassoon, Bart., Air Vice-Marshal Sir J. M. Salmond, K.C.B., and Air Vice-Marshal Vyvyan. H.R.H. the Duke of York, K.C., will be present, and H.H. Princess Marie Louise will give the prizes.

Inter-Services Lawn Tennis Tournament.

In the Inter-Services Lawn Tennis Tournament, which was concluded on Saturday at Queen's Club, the Army gained a decisive win by securing 10 matches out of 15. The Royal Navy and Royal Air Force won four matches and one respectively.

Wing Commander H.R.H. the Duke of York and Wing Commander Greig, who were the first string for the Royal Air Force, were beaten 6—2, 6—1, by Major A. R. F. Kingscote and Major A. N. W. Dudley. One understands that Wing Commander Greig was somewhat tired out by a previous strenuous match, which explains the one-sided character of the contest, but everyone knows that to get any games against England's best player is no mean feat.

Group Captain Ludlow-Hewitt, R.A.F., who was beaten by Commander Bell, R.N., is described as "a good stroke player with no reliability." Possibly he wants re-timing or it may be due to faulty carburation or a bad magneto. Or, again, he may have been influenced by some of the engines he used in the early days.—G. D.

ITALY.

The Italian correspondent of THE AEROPLANE writes:—

The Delivery of German Aircraft.

The organ of the Interventionists of Turin—both in the Services and not—has the following from Berlin, dated July 7th, 1920:—

"We are in a position to give the good news that of the six airships belonging to Germany two have been assigned to Italy instead of one, as had been arranged. Our right to them, strongly sustained by Colonel Scelto, head of our Mission at Berlin, has succeeded in overcoming all opposition to the claim.

"At the end of July the first vessel will sail for Rome, where she would have been already if the sheds ordered for the vessels had been ready, which hangars, according to Col. Scelto, the late Directorate of Aeronautics has failed to build.

"The second vessel will follow shortly after. The ships are the dirigible balloons L.61 and L.Z.113. They are 196 metres long, and have a cubic capacity of more than 50,000 metres, and four cars each (gondolas).

"As well, 100 aeroplanes and 300 motors for aircraft have been assigned to Italy, fifty trucks of this material having already reach the frontier."—T. S. H.

JAPAN.

The correspondent of THE AEROPLANE in Japan writes:—

The Siberian Front.

Our aeroplanes belonging to our troops in Siberia are few in number, while many of Bolshevisk aeroplanes have appeared very often at the front, so that our Army authorities consider that it will be necessary to send additional aeroplanes to the front and have decided to send about 20 additional machines there.

A New Army Aerodrome.

The new Army aerodrome is now in the course of building at Phyong-yang, Korea, and another will be established near Chiba, Chiba Prefecture. Both of them will be finished some time in the next year, and two additional flying battalions will be stationed in those places.

The Delivery of French Aeroplanes.

Seventy Spad machines of French make were delivered to the Army Flying Corps from France a few weeks ago, among them were single-seater fighting machines with 180 h.p. Hispano-Suiza engines and Salmson 230 h.p. engined two-seated scout machines.

Aeroplanes in the Japanese Army.

Up to the present the aeroplanes used by the Army Flying Corps were very different types, such as Nieuport, Sopwith, Avro, Salmson, and Spad, etc., but it is decided that in the future they will use only some special type of Army standard machine, and several plans for machines of this type will shortly be completed.

A New Naval Aviation Depot.

The Imperial Navy has decided recently to establish a large aeroplane workshop at Kure, at an estimated cost of Y 30,000,000.

These workships will be the largest establishments of their kind in Japan, and they will be able to make 60 machines every month. It is also expected that the works will be completed in about two years, and that many officers and workmen will be sent to Europe and America to research the work of plane making.

Aeroplanes in Japanese Warships.

The Imperial Navy has made a provision very recently for certain warships of each fleet to have several machines of ships-scout type on board, and they already are using the machines on the Sea of Japan and Pacific, and elsewhere.

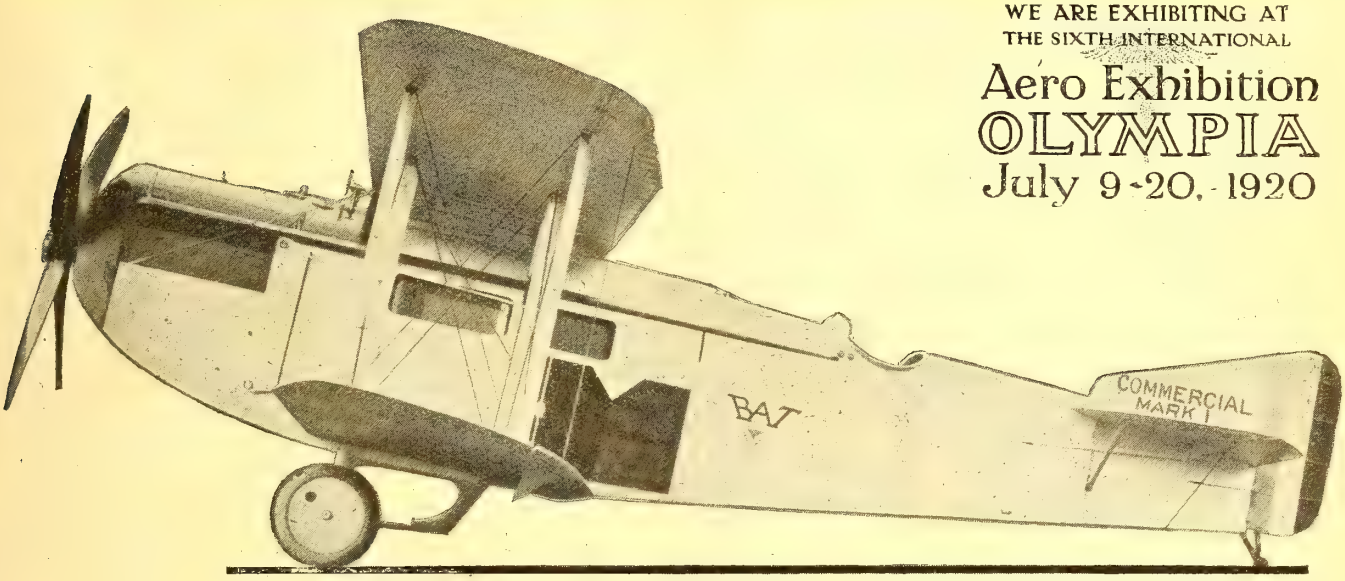
German Aeroplanes and Japan.

Lieut. S. Niwa, of our Navy, arrived home from Europe on May 4th. He said that 'Large numbers of German aeroplanes would be divided in the following ratio: British and French, 25 per cent., America 15 per cent., Italy 10 per cent., Japan and Belgium 5 per cent.," and the officer said further, "That some of German airmen are planning a flight between Berlin-Tokio non-stop, in the near future, and that they expect to arrive in Tokio from Berlin after a flight of only 90 hours."

Tellier Seaplanes for the Navy.

Several Tellier (twin-engined, 600 h.p.) machines of French make have arrived for the Navy from France a few weeks ago, and the first flying tests will be carried out by our Navy airmen before long.—N. K.

WE ARE EXHIBITING AT
THE SIXTH INTERNATIONAL
Aero Exhibition
OLYMPIA
July 9-20, 1920



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As recently supplied to the INSTONE AIR LINE.

The machine here illustrated is the B.A.T.—"Commercial Mark I"—universally acknowledged to be the most practical and efficient commercial aeroplane yet produced. Although a relatively small machine—only 34 feet over-all length—it possesses surprisingly commodious cabin and cargo accommodation. Four passengers can be carried comfortably, with ample room for personal luggage, or, alternatively, parcels or mails to the extent of 1,000 lbs. in weight and **150 cubic feet in capacity**.

Here are some additional interesting points concerning the machine:—

Engine:—375 Rolls-Royce Eagle VIII.

Speed:—45-115 m.p.h.

Cabin:—Is clear of any transverse cross bracings or other obstruction, and measures 8 ft. by 3 ft. 3 in. by 6 ft.—this is a machine of 34 ft. overall length Direct entry off ground through ordinary door.

Load:—With 600 mile range oil fuel—1,000 lbs.

Fuel Cost at Full Load:—7.2 pence per mile.

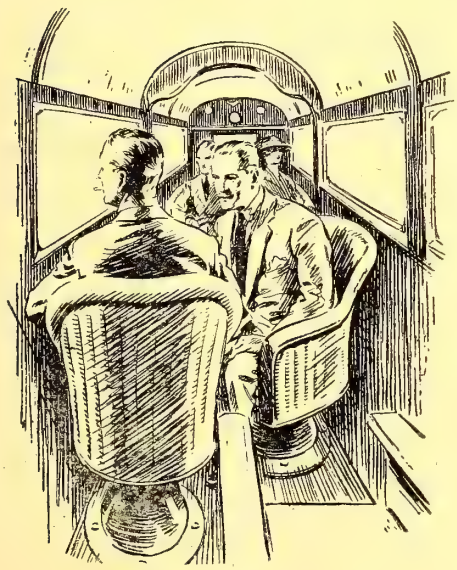
Chassis:—A sturdy job, sprung by an unique combination of oleo and rubber shock absorbers.

Tail:—Can be trimmed in flight from pilot's seat—steerable and practically unbreakable tail skid.

General Construction:—Straightforward—simple to repair and recondition

The B.A.T. as a commercial machine has so many natural advantages, and is so moderate in first cost, that it is really the ideal machine to employ in inaugurating air transport services.

A demonstration flight can be arranged and all particulars obtained on application to;—



An impression of the interior of the cabin of the Bat Commercial.

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Aero Show—Olympia, July 9-20

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This gives a rigidity and resilience unattainable by any other method. Weight for weight it is the strongest material yet evolved.

"**CONSUTA**" is used for the cabins of the commercial type of Vickers "Vimy" bombers, entirely dispensing with the use of cross-bracing wires. It is now being used for the whole covering of flying boats—the largest type yet built. Its uses are limitless.

The sheets are made to any desired size or shape up to 8 feet wide by 60 feet long, and from ⅛ inch to ⅝ inch thick, thus eliminating waste in conversion.

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AERONAUTICAL ENGINEERING

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INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE LESSON OF OLYMPIA, 1914-1920.

It is now over six years since the previous Aero Show held at Olympia, and it cannot fail to be of interest to remark upon the differences which exist between the aeroplanes which were exhibited then and those that are to be seen at Olympia to-day.

In many ways the contrast is extremely striking—even to the casual beholder—in others it is amazingly small. In form and in general aerodynamic design the areoplanes of 1920 bear a very strong resemblance to those of 1914. A monoplane, biplanes, and triplanes all appear in 1920.

In 1914 the probable complete disappearance of the monoplane in the very near future was widely expected—and in fact to-day there is but the B.A.T. "Crow" in this class. Nevertheless, there are distinct signs and portents presaging the return of the monoplane in the not very distant future.

In 1914—if one remembers aright—the triplane was already dead, yet here at Olympia are to be seen two of the class—both amongst the most modern of British Commercial Aircraft.

In 1914 there were tractor machines of the fuselage type and pushers—of the open tailboom type.

To-day, "pushers" are confined to the flying-boat type, nevertheless, there is exhibited a scale model of a design for a large passenger seaplane, put forward by one of the most experienced of the constructors of sea-aircraft as the commercial seaplane type of the future. The flying-boats of 1920 had their ancestor in the Pemberton-Billing exhibit of 1914—and that—even then known as a "Supermarine"—was an extraordinarily accurate forecast of the Supermarines of to-day.

Of amphibians there were none at the Show of 1914. To-day there are two—one, it is true, exhibited without its "amphibbing" gear—but Olympia, 1914, contained one Sopwith "Bat-boat"—and a Sopwith "Bat-boat" had long since won the Mortimer Singer prize for an amphibian performance.

Thus Olympia gives but cold comfort to those partisan prophets who decree the disappearance of this or of that particular type of aircraft structure.

In the matter of actual size and capacity of individual aircraft there has been a change. Though the present exhibition contains machines smaller than anything before exhibited there, yet the effect of the three samples of multi-engined passenger carriers produces the impression of a very considerable general increase in dimensions. Actually, it is very doubtful if the average wing surface per machine at the two Shows differs very much—but if the true criterion, the average weight, be taken, 1920 is very far ahead, though here, again, the smallest aeroplane of 1920 is lighter than any machine of 1914.

Which brings to light one very important index of the line of progress along which aeroplane design has moved. Against all the prejudices of those who fly—and of many of those who do not but who profess to direct the science of aeronautics—the relentless needs of practice have forced up surface loadings—not for the sake of loading, but that the aeroplane might become a practical useful vehicle, with some reasonable relation between the amount of aeroplane and the amount of cargo it can carry.

In the power of engines installed 1920 again extends upwards very much further than did its predecessor. Nothing which really flew at the last Exhibition had a smaller engine than the 35 Green of the Avro "Baby"—but the 1,600 odd h.p. of the Bristol Pullman in the form in which it occurs would probably have caused less sensation at the earlier Show than the 800-h.p. in one single engine of the Sunbeam "Sikh" engine—or even the 600-h.p. of the Rolls "Condor."

Yet the great increase of power now employable is not the real sign of progress in the art of aeroplane designing. To-day each h.p. goes further than it did in 1914. The weight per h.p. of the completely loaded aircraft of to-day is lower than that of 1914—consequently, the machine of to-day flies faster—but although the total weight per h.p. is less a greater useful load is carried, and carried faster.

For 1914, passenger and pilot carried for three hours at 60 m.p.h. by 60 h.p. would have been an excellent performance, or one passenger mile per h.p. hour. To-day, with 120 h.p., three passengers and pilot at 80 m.p.h. for the same time would not be abnormal—which comes to precisely two passenger miles per h.p. hour.

Here, then, is the message of Olympia—the complete answer to all those enthusiastic pessimists who cheerily assert that there is no future for commercial aviation.

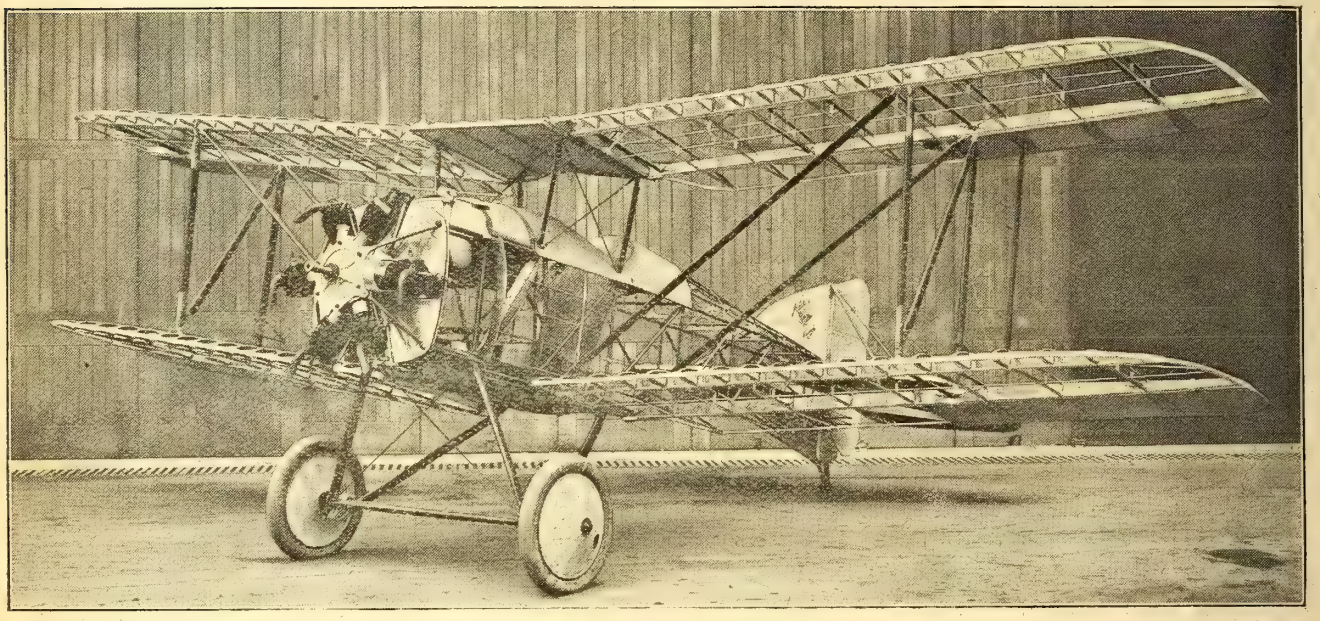
Aerial transport is—at the moment—an expensive method of moving goods. Yet in the years between 1914 and 1920—years devoted almost solely to the development of aircraft for a purpose diametrically the opposite to that of commerce—the factor which most directly affects the cost of aerial transport has been reduced in the ratio of two to one.

With the present knowledge of the art of aeroplane design, with a proper appreciation of the lessons which Olympia from 1914-1920 discloses, and with a little courage and enterprise on the part of those who have made war profits out of the Aircraft Industry, there should be little difficulty in again doubling within distinctly less than another six years the useful results of one horse-power expended in driving an aeroplane.

But neither lecturing the British public on their indifference to the possibilities of aerial transport nor wailing to the British Government for financial assistance will produce this result.

A little steady work, and a little—really quite a little—capital invested in the certainty that no E.P.D. will be levied on its returns for the next two years will do more to hasten the real coming of commercial air transport than would £50,000,000 per annum of Government subsidies.

THE AUSTIN MOTOR CO., LTD., Northfields, Birmingham.



The Austin Whippet (60-h.p. Anzani Engine) in the skeleton condition wherein one sample appears at Olympia.

The Austin Company show one of their neat little single-seater biplanes in its complete form and one in skeleton form. The two together are as convincing evidence as one can wish of the Austin Company's ability to build a thoroughly sound aeroplane. Among the small machines the "Whippet" can certainly hold its own in the front rank.

The man who can afford and is allowed to keep a single-seater machine would certainly find that the "Whippet" fulfils all his requirements. It is pre-eminently a machine for a man who is an expert pilot, but whose mechanical ability does not go any further than keeping an engine running.

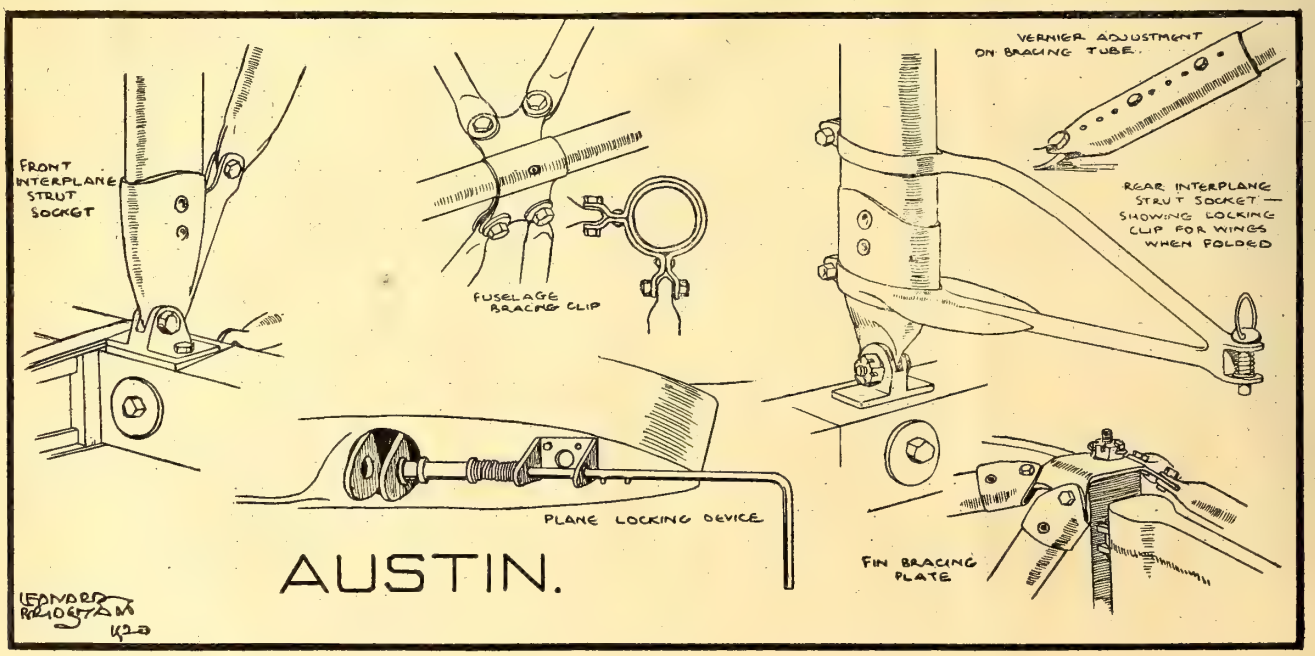
The fuselage, for example, is constructed entirely of steel tubing, so that there are no bracing wires to slacken off and need tightening. Similarly the wings, although of standard design, are constructed with steel interplane struts of streamline tubing, and, instead of lift wires, streamline tubing is used, so that not only are no landing wires required, but there is no adjusting of bracing wires to bother the un-expert pilot. Practically the only adjustable surface about the machine is the tail plane, which can be varied to suit different weights.

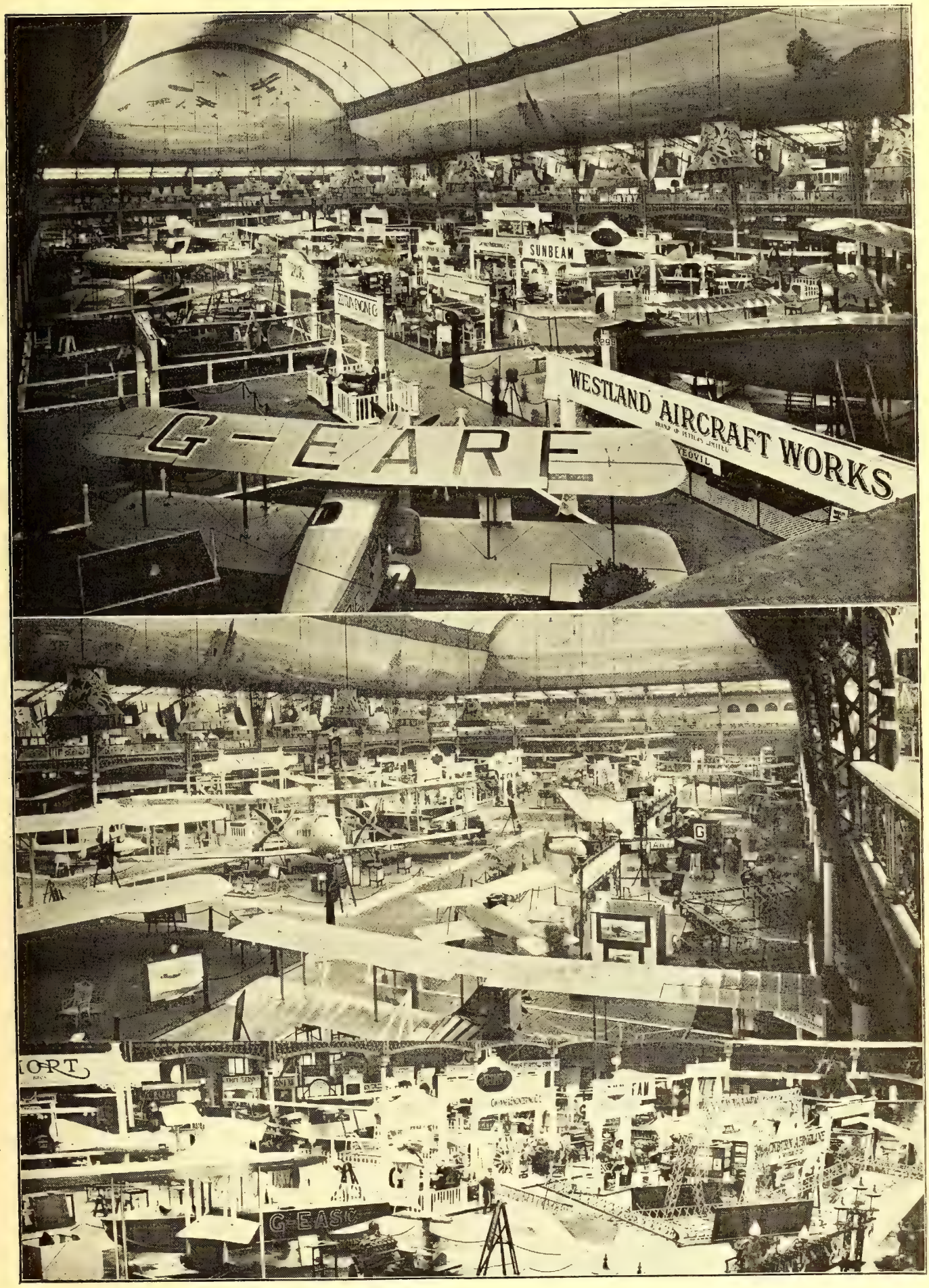
The undercarriage is of the standard "V" type with streamline tubes for the struts, the axle being mounted as usual on rubber shock absorbers. Standard type Palmer wheels are fitted. The tail skid is of the steerable kind, so that the machine can be manœuvred on the ground as easily as a motor-bicycle. In spite of the small size of the machine, the wings are made to fold along the body, and this very desirable feature is achieved without adding to the weight of the machine to any appreciable extent. The result is that we have here a very small machine which, thanks to its folding wings, can be stowed in any ordinary garage.

Moreover, the folding arrangement of the wings is so utterly simple that the machine can be folded up by one man in less than a minute, and when folded the machine is so light that one man can easily walk about with it with the tail skid resting on his shoulder. Thus, any pilot who has the use of a decent-sized field within a few hundred yards of his house can easily keep the machine in his garage or in a shed, roll it out into the field, open his wings, and fly away without any help.

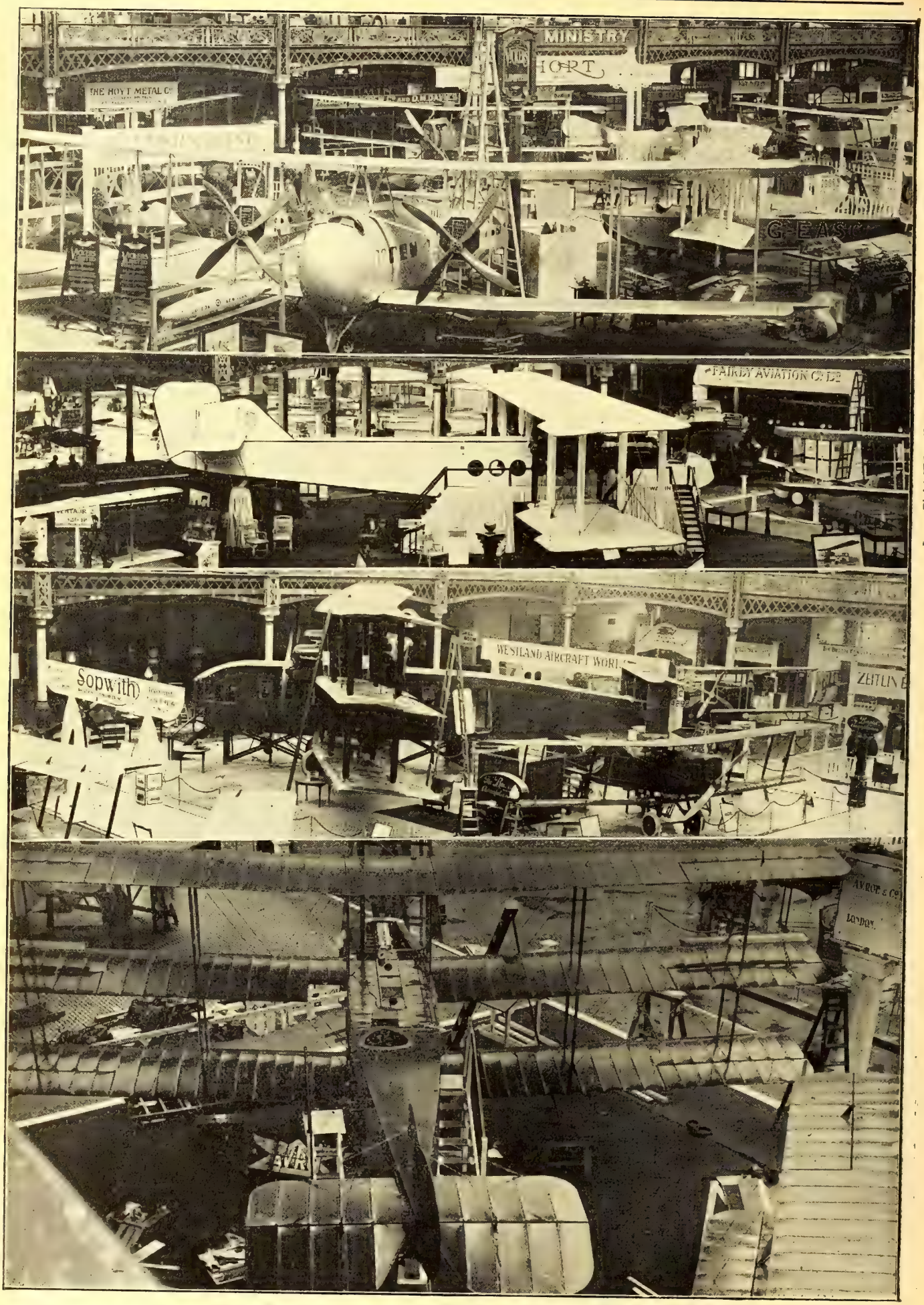
The Air Ministry, after being satisfied as to the design and construction of the machine, is prepared to grant certificates of air-worthiness for the type as regards strength and aerodynamic qualities. Perhaps even more important from the purchaser's point of view is the fact that the first experimental "Whippet" has already done an enormous amount of flying and has proved itself to be a thoroughly practical vehicle.

Captain Nares, the firm's pilot, flew it from the factory at Birmingham to Bristol, a distance of 90 miles, in an hour, and on continuing his journey from Bristol to London success-





AT OLYMPIA.—Top, the Show viewed from the East End. Middle, the Show viewed from the West End. Bottom, the Engine Section of the Show.



AT OLYMPIA.—Top, the Vickers Stand. Second, the Handley Page "W.8." Third, the Bristol "Pullman" and "Coupé." Bottom, the Avro Triplane.

THE THREE NEW TYPES OF

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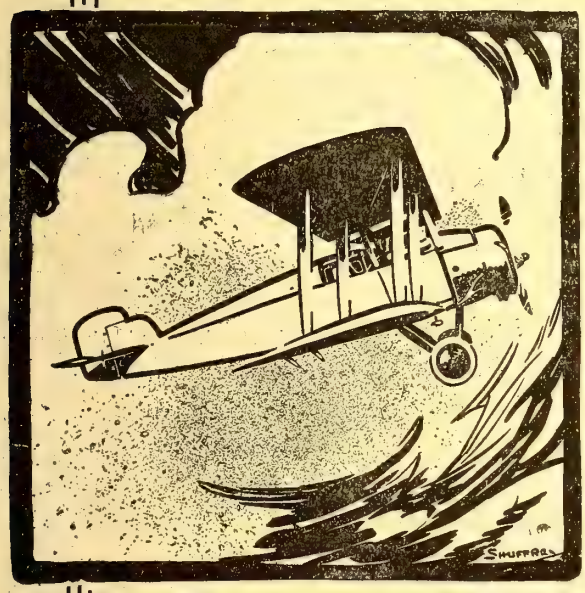
CIVIL AIRCRAFT—



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OLYMPIA.

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There were **16,237** aeroplanes built to Sopwith design for the Allies, including Scouts, Fighters, Armoured Fighters, Reconnaissance Machines, Bombers, Seaplanes, Torpedo Planes, Ship Aeroplanes.

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Agents for Australasia: THE LARKIN-SOPWITH AVIATION CO. OF AUSTRALASIA, LTD., 18, GURNER STREET, ST. KILDA, MELBOURNE; also ABERDEEN HOUSE, 94, KING STREET, MELBOURNE; and LONDON BANK CHAMBERS, Corner of PITT and MOORE STREETS, SYDNEY.

fully fought his way through a sudden 60-mile-an-hour gale which caused a very considerable amount of damage on land, while he was safe in the air.

The speed of the machine in still air is about 90 miles an hour, but it can land at 35 m.p.h. under ordinary circumstances, and a really skilful pilot like Captain Nares can practically sit it down on a handkerchief.

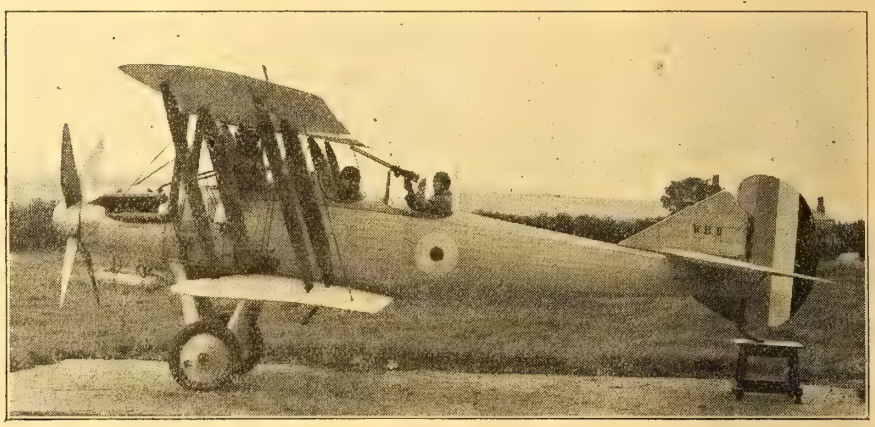
Apart from the "Whippet" being an ideal pleasure machine, it really has a considerable commercial value. For example, it would be ideal for forest patrol work, for it could be flown from an aerodrome which would be too small for a big surface machine. Owners of large estates even in England would find it useful for quick communication. And there are ex-pilots in Australia, South Africa, Canada, and South America who, if not owners of large tracts of country themselves, are the sons of owners and are at present employed in the administration of those estates. Such pilots would find the Austin quite a useful mount.

Specification of Austin "Whippet."

Span	21 ft. 6 in.	Weight (full)	810 lb.
Chord	3 ft. 8 in.	Weight (empty)	580 lb.
Gap	3 ft. 10 in.	Engine	50-h.p. Anzani
Length	16 ft. 3 in.	Speed	95 m.p.h.
Height	7 ft. 6 in.	Climb	10,000 ft. in 22 min.
Surface	140 sq. ft.		

WM. BEARDMORE & CO., LTD., Dalmuir, nr. Glasgow.

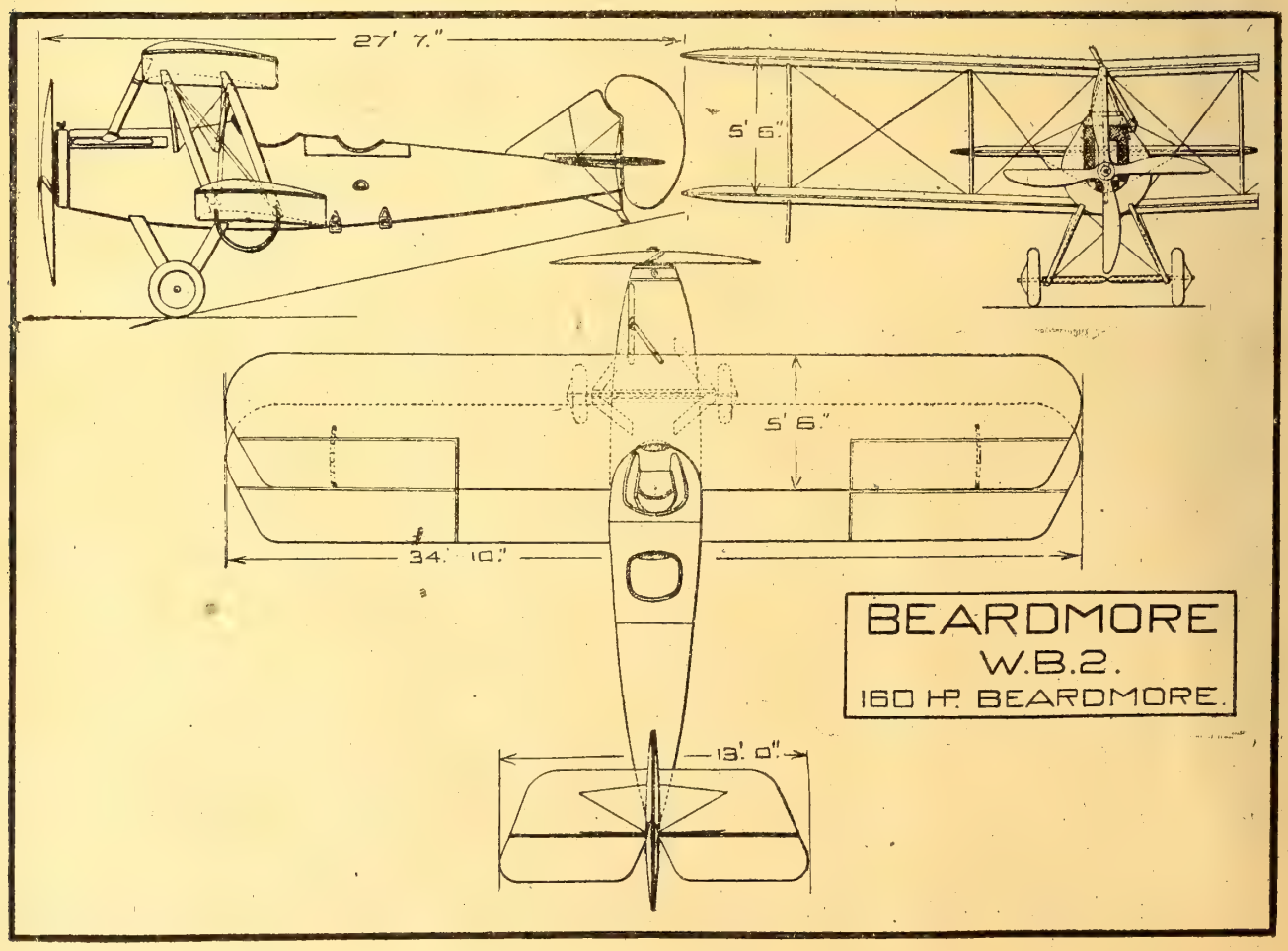
THE BEARDMORE W.B.II BIPLANE (200-h.p. Hispano-Suiza engine).—The machine is here seen in its war-time guise, the passenger seat equipped with a gun mount. The passenger version at Olympia is devoid of this, and the accommodation in the aft seat has been improved in comfort considerably. The engine has been altered to one of the firm's own make of 160 h.p., but in general form and appearance the two are very similar.



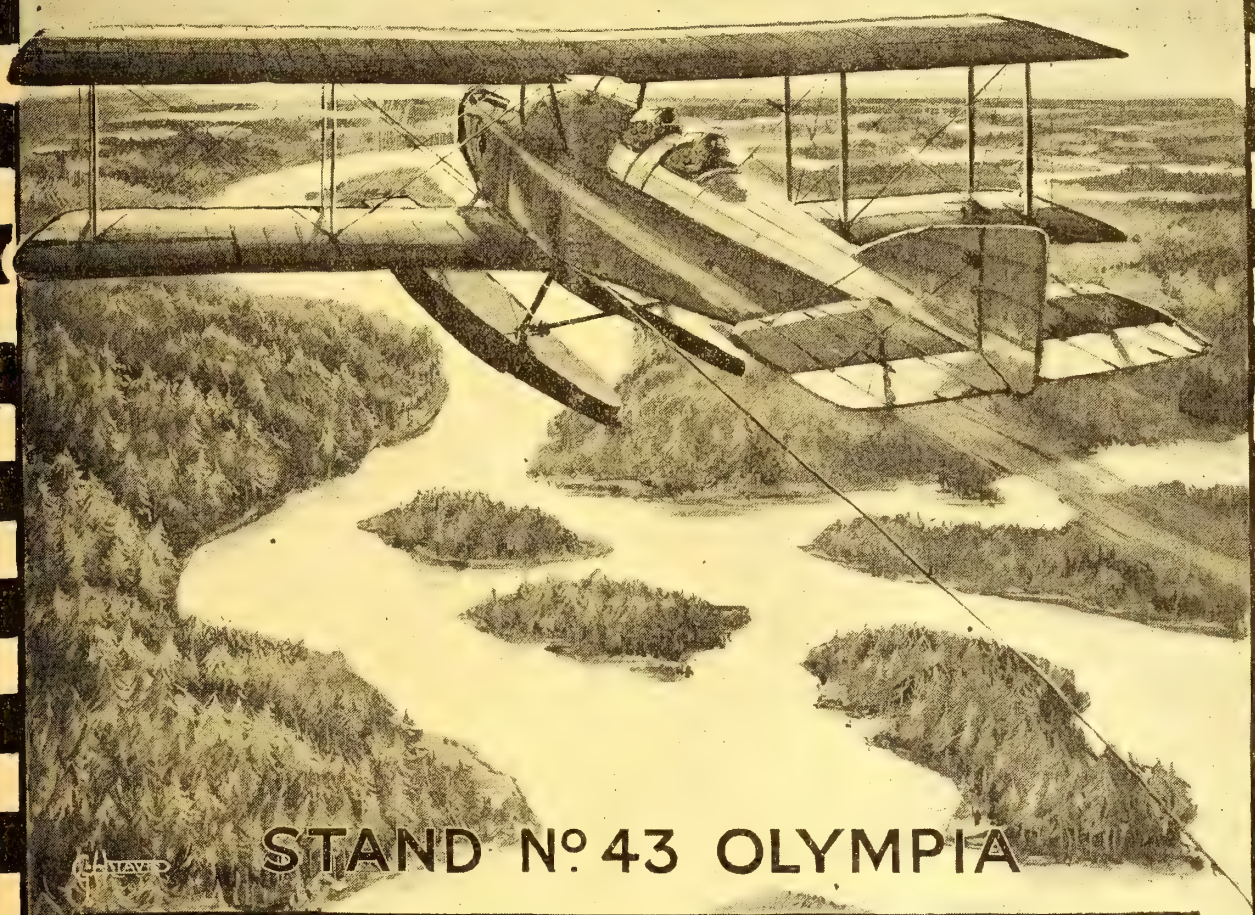
The Beardmore W.B.2.

Based in its main details on a two-seater reconnaissance machine built for the Air Services, this machine in its peace-time guise serves admirably the many purposes to which any really good two-seater may be put. For sporting purposes, for touring, and for the rapid transport of light goods or mails, it will be found directly available, and those who would test its air qualities may, it is understood, sample them on a second specimen which is to operate at Cricklewood during the Show.

The machine is a clean, straightforward, tractor biplane, built on proved and sound lines. The fuselage is on four ash longerons, spruce strutted, and tie-rod braced, and is faired to a circular section with formers and laths of spruce.



MARTINSYDE
EXPLORATION



STAND Nº 43 OLYMPIA

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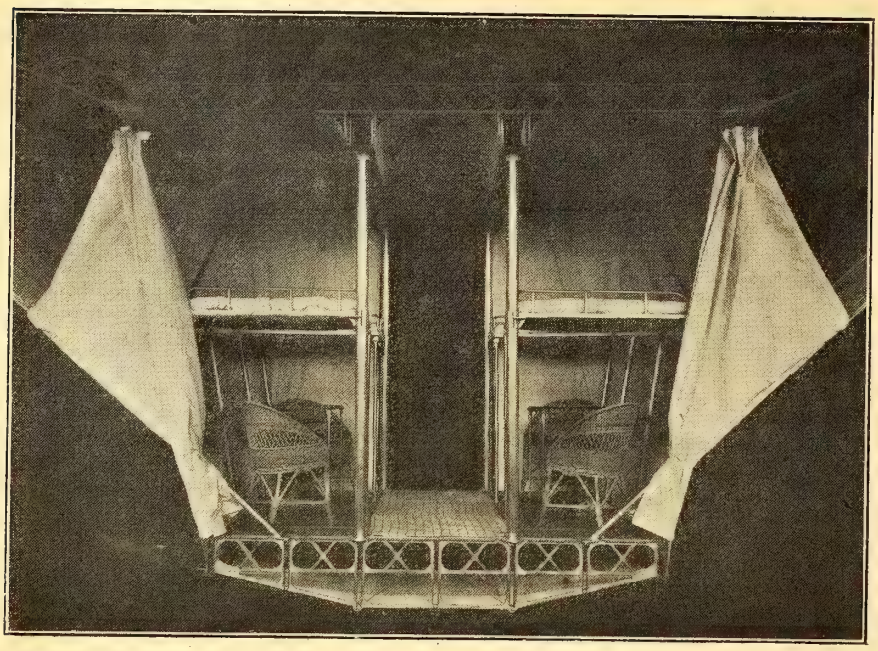


The Passenger Car designed by Sir Wm. Beardmore, Ltd., for a rigid Airship of the R.36 type. At the top may be seen the bottom section of the main frame ring, and from this duralumin tubes on each side of the central gangway, duralumin girders concealed by the turned-back fabric, and bracing wires running up to the next section of the main frame of the ship support the usual "catwalk." Between the gangway and the sides very neat folding bunks afford sleeping accommodation, fabric curtains dividing the cabin up into two-berth compartments. Below the bunks wicker chairs and tables provide comfortable eating or writing accommodation.

The wing structure is an equal span and chord biplane, staggered fairly heavily, and fitted with two rows of struts a side. Spars, ribs, and struts are of spruce, with steel fittings and streamline wires.

A silenced 160-h.p. Beardmore engine supplies the motive power and is fitted with a hand-starter. It is fed with petrol from a gravity service tank in the top plane, supplies whereto come from the main fuselage tank, impelled by an air-driven pump, with a stand-by hand-pump in reserve.

Except the rudder, all controls are unbalanced, and are operated by the usual combination of joy-stick and rudder-bar.

The dimensions, etc., of this type of Beardmore are given hereafter.

Specification of the Beardmore W.B.2.

Span	34 ft. 10 in.	Weight, loaded	2,516 lb.
Chord	5 ft. 6 in.	Useful load	180 lb.
Gap	5 ft. 6 in.	Petrol capacity	50 gals.
Length overall	27 ft. 7 in.	Endurance	4 hr.
Height overall	10 ft. 11 in.	Speed	55 to 107 m.p.h.
Total surface	354 sq. ft.	Climb	10,000 ft. in 25 min.
Weight, empty	1,751 lb.		

At the time of going to press the second of the Beardmore machines had not arrived at Olympia, but an additional exhibit in the form of the airship passenger car illustrated below was on view.

THE BLACKBURN AEROPLANE AND MOTOR CO., Olympia, Leeds.

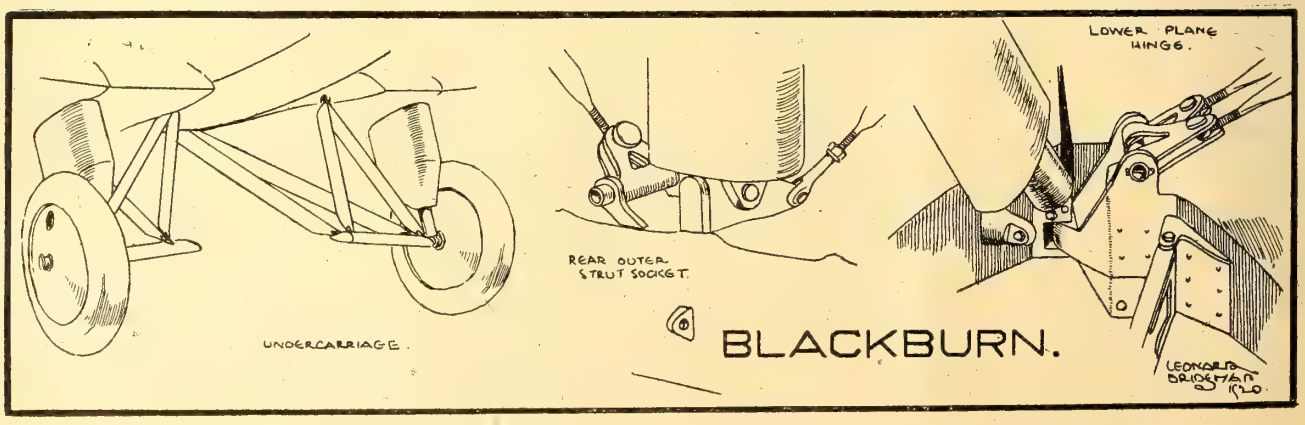
The Blackburn "Swift."

This aeroplane, which is exhibited by the Blackburn Aeroplane and Motor Co., Ltd., at Stand No. 64, the Aero Exhibition, is the latest model of torpedo-carrying ship aeroplane. Official permission to exhibit it has been granted on condition that certain special equipment, notably the torpedo gear, is not shown, and for an equal reason this gear cannot be described. Hence the machine exhibited may be regarded simply as a ship aeroplane of high performance and high load-carrying capacity.

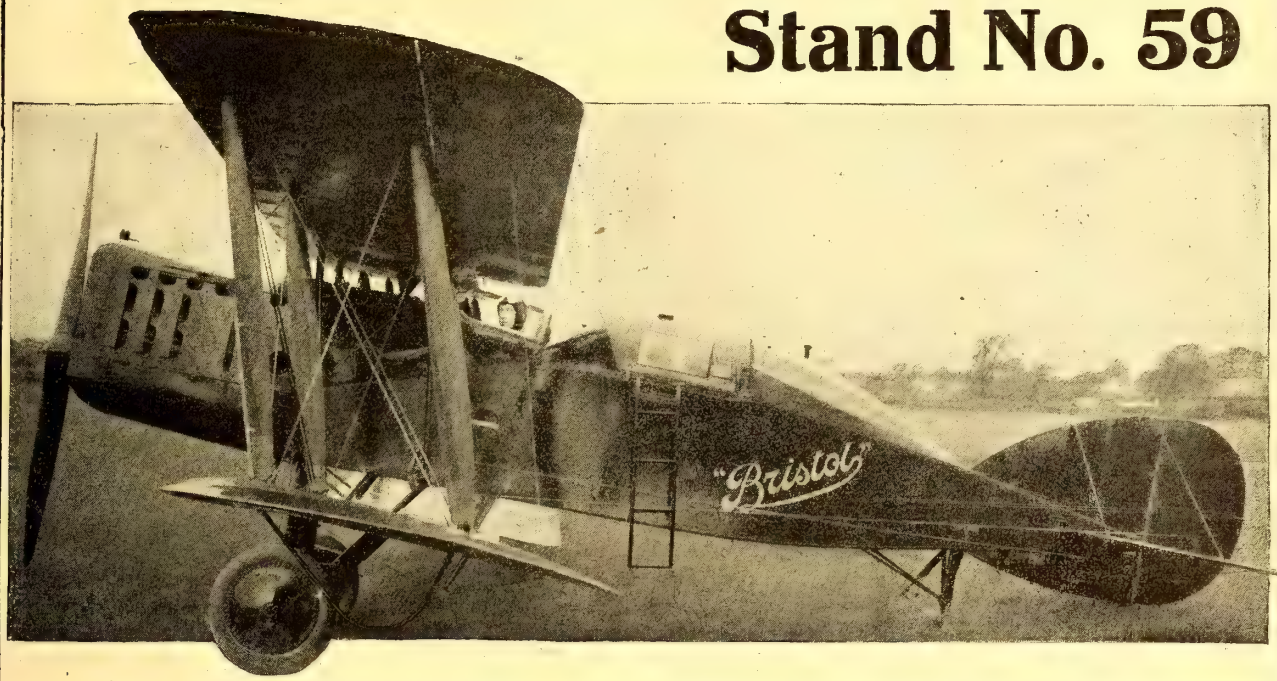
From the standpoint of efficiency in performance the design is best judged on the figures appended. The speed and useful load figures are good for an ordinary machine and exceptional for a ship aeroplane, subject as the type is to rigid limits of surface and landing speed. The pilot's view facilities have received attention, and partly owing to his relatively high position, partly to the clean lines of the fuselage, there is an exceptional field of vision forward, down and to the sides.

As regards behaviour in the air, the design gives a high measure of stability, allowing "hands-off" flying for long periods, whilst the arrangement of controls renders muscular effort negligible. Manœuvrability is excellent, owing to the concentration of the main loads about the centre of gravity.

Constructionally, the "Swift" is robust and elastic to meet the strain of sudden manœuvres. In the detail work, great care has been taken to guard against corrosion due to sea-air and salt-water. Another aim has been the minimisation of upkeep labour: the whole of the central unit, comprising the engine mounting, centre part of fuselage, undercarriage, and centre section of wings, is a steel framework which practically can never need trueing up. The rubber compression-buffer springing of main wheels and tail skid is another feature of durability, which long experience with similar springing of "Kangaroos" has shown to need practically no attention in service.



Stand No. 59



HIGH PERFORMANCE, RELIABILITY, ECONOMY AND A LENGTHY PERIOD OF EFFECTIVE SERVICE —

—these are the salient features of the "BRISTOL" Tourer. Three distinct types are constructed, namely, the Two-seater Tourer, the Three-seater Tourer having a rather wider fuselage, and the Three-seater Coupe Tourer in which the passengers are protected from the weather in a comfortable streamlined coupe. The petrol tanks have a capacity of 70 gallons—sufficient for a non-stop flight of about 600 miles while transporting a load of 400 lbs.

Further particulars of

The "Bristol" Aeroplanes

may be had at our Stand.

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Telegrams : "Aviation, Bristol."

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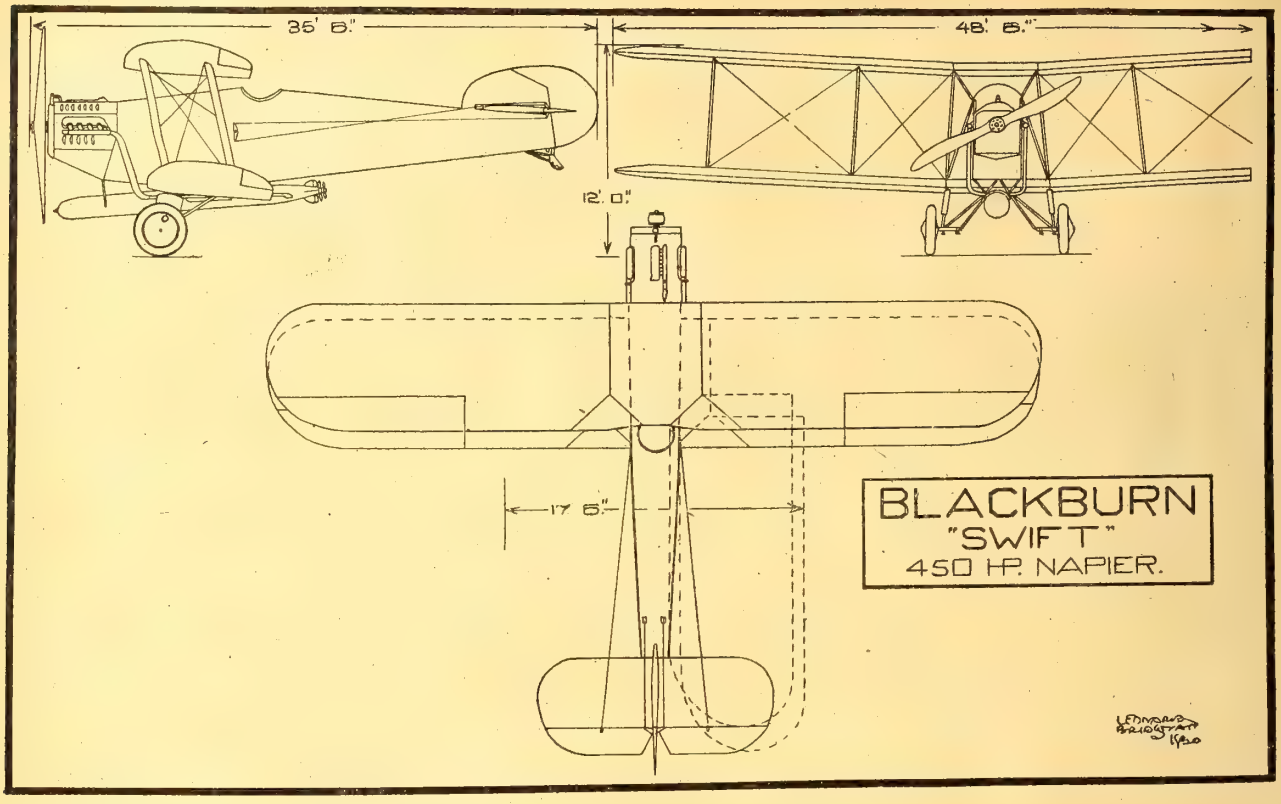

Safety from fire has also received attention. The engine installation is cut off by a fireproof bulkhead from the remainder of the fuselage. The main fuel tank is of the self-sealing type, petrol being pumped thence to a small gravity tank in the upper plane. The installation is arranged to give full accessibility for minor engine adjustments and also permits of easy removal of the engine for full overhaul or large repairs.

The engine is fitted with a silencer which has been specially developed by the Blackburn firm for use on torpedo-planes, where the sound of an unsilenced engine is likely to attract early and unfavourable attention from the target ship.

This silencer takes the form of a large 4-diameter expansion chamber some three feet long inserted in the exhaust pipes of the engine. It is said to be extremely effective.

As a ship aeroplane, the "Swift" is fitted with airbags for flotation in the event of forced landing at sea, and with wheels automatically removable in the air, to render such landings safe. Slings for hoisting aboard ship are also fitted. To facilitate stowage on shipboard, the machine folds its planes, and the folding gear is of interest not only for its sound mechanical design, but also because in this case staggered wings are arranged to fold. This presents certain difficulties, and heretofore folding wings have entailed the loss of that appreciable improvement of the pilot's view and the slight increase in performance which staggered wings permit.

Of its qualities as a torpedo-carrier, one may not speak in detail. It is, however, admissible to state that it is the outcome of over three years' experience in this particular class of work, during which the Blackburn Aeroplane and Motor Co., Ltd., has had unparalleled opportunities of obtaining experience and of collaboration with official experts. The list of Blackburn Aeroplane and Motor Co. torpedo-plane patents alone is clear evidence that the "Swift" is, in this respect as in others, of the first class, and that the Company may fairly claim to be specialists in torpedo-carrier design.

Of the actual details of the Blackburn "Swift" one may say that it is a tractor biplane of rather unusual appearance. The fuselage, which is of very great size for a single-seat machine, is of a curious form, which gives to it the air of having been cut into three pieces and then joined together with the central piece upside down. The engine has an appearance of being cocked up in front at some appreciable angle, the top of the section of fuselage from aft the engine to the pilot's cockpit definitely rises fairly sharply, and thereafter to the tail the top line descends again—thus giving to the upper contour the form of a widely-opened N. It is to be assumed that the pilot's seat is raised to the limit for view purposes, and that devoid of the hump provided for him the outline would be normal.

The undercarriage and centre section are another noticeable feature. Top and bottom centre sections, together with the undercarriage, are built up into a unit. The upper centre section is of slightly less span than is the lower, and the two are connected by four interplane struts raking inwards upwards. From both top and bottom of each of these struts others slope inwards to the top fuselage rail. The lower edge of the fuselage is secured to the lower centre section spars.

Below each of the front spar centre section struts is provided a telescopic rubber-sprung chassis strut, supported by a hinged strut running backwards from its base to the base of the rear spar struts, and on each side heavy tubes, fixed a little off the centre line of the bottom of the fuselage, run towards the telescopic strut and thence horizontal tubes form the wheel spindles.

There is thus a clear space below the fuselage for the dropping of the machine's load.

The wings are set onto the fuselage at a very coarse angle and with an appreciable stagger, and are attached to the centre section by hinges on rear spars and spigot and socket joints on the front spar, thus folding. Owing to the combined stagger and inward rake on the centre section struts the wings, folded, are inclined upward and the top wing retreats inward over the fuselage, the lower one remaining outside the lines of the body when seen in plan.

In the wings themselves there seems little to call for comment. They are of equal span and chord, and are all fitted with ailerons of the unbalanced type. They appear to be of a distinctly high lift type, which, considering the small dimensions and the considerable weight of the whole, seems natural.

Such structural details as are visible show the machine to be extremely robustly built, steel fittings of the tin clip type being conspicuously absent, their place being taken by machined stampings or forgings.

Altogether the machine has the look of having been designed for purposes of offence.

Specification of the Blackburn "Swift."

Span (open)	48 ft. 6 in.
Span (folded)	17 ft. 6 in.
Length	35 ft. 6 in.
Height	12 ft.
Engine	450-h.p. Napier
Total weight, fully loaded	6,000 lb.
Useful load (including crew, but not fuel)	1,975 lb.
Fuel capacity	4 hrs., full power
Mainplane area	720 sq. ft.
Full speed	98 knots
Landing speed	43 knots
Getting-off speed	40 knots
Run to unstick	40 yds. in 20-knot wind
Range	392 nautical miles
Rate of climb	850 ft. per min.
Service ceiling	15,000 ft.

AERO EXHIBITION

STAND 40

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THOS. FIRTH & SONS, LTD.

SHEFFIELD

THE BRISTOL AEROPLANE CO., LTD., Filton, Bristol.

The Bristol people show two examples of their excellent work, namely, the big "Pullman" triplane and the three-seater "Coupé Tourer." As is customary with the Bristol firm, their exhibit gives one the impression of solid construction and sound workmanship such as inspires confidence in those who are likely to use aircraft.

THE BRISTOL "PULLMAN."

The "Pullman" triplane is practically the Bristol "Braemar," which was produced during the war, rearranged as a passenger machine. This is its first appearance in public. It is notable among big machines of its class for its high speed, which is modestly stated at 125 m.p.h., though uncorrected air speedometer readings show a maximum speed of 134 m.p.h. With the engines a little more than half throttled the speed recorded was over 100 m.p.h., so that evidently it is capable of long range work at comparatively high speed without over-straining the power plant.

The noticeable feature about the planes apart from their size is the fact that they are considerably swept back from the centre section. The bracing strikes one as being particularly good, in that the flying wires run from the bottom plane to the top plane, thus giving a very good angle of bracing. The middle plane is fixed to the point of intersection of the flying and landing wires. The interplane struts, however, instead of going straight through from the middle plane to the top, form separate struts from the bottom plane to the middle plane and from the middle plane to the top plane.

The engine nacelles are of particularly neat design and are held in a diamond-shaped arrangement of six struts forward and six aft. Two struts forming a close V run direct from the engine bearers to a point on the bottom front spar, and two more run similarly from the back of the engine bearers to the bottom rear spar. From the same points in the spars big strong struts run direct to the centres of the wheels.

The radiators are placed under the engine bearers and are fixed to these Vs. From the bottom of the radiators other struts run upwards and outwards to the middle plane spars, and from those points on the middle plane other struts run upwards and inwards to the top spars. The whole of this strutting is skilfully braced with streamline wires.

The undercarriage consists of a wonderful arrangement of four wheels with radius rods and shock absorbers inside streamline casings. The two wheels on each side are connected one with the other by a deformable parallelogram of steel tubes which ensures their tracking properly.

The fuselage, which is an elaboration of the usual strut and steel stay arrangements, has seating accommodation for 14 people in addition to the pilot and engineer. There is 7 ft. of head room in the cabin, so that to a very great extent one is relieved of the cooped-in feeling inseparable from smaller machines.

The tail unit is a biplane with three rudders, the centre one of which projects above the upper tail plane. The elevators and ailerons are both balanced and so is the centre rudder, but the two outer rudders are not balanced.

The pilot and engineer are seated right in the nose of the machine in a species of conservatory which should afford them an excellent view. The control arrangement is by a single wheel for elevators and ailerons and by a pair of pedals instead of a rudder bar for the rudders. This rudder-pedal arrangement certainly strikes one as being more comfortable even if slightly heavier than a rudder bar. Those who flew the old Maurice Farman will probably agree.

The engine controls at first appear somewhat fearsome, and strongly resemble the interior of a signal box at an important railway junction. They are in fact really very simple, more especially so as the controlling of the engines is chiefly done by a mechanic who sits alongside the pilot, instead of by the pilot himself.

A full description of the controls would in fact require a separate article to itself, and one therefore recommends readers to go and inspect this portion of the exhibit with special care.

SPECIFICATION OF THE "PULLMAN."

Span—	Engines ...Four "Liberty," 400 h.p. each
Two upper planes 81ft. 8in.	
Bottom plane ...78 ft. 3 in.	Weight—
Chord .....8 ft. 6 in.	Full .....17,750 lb.
Gap ..... 7ft.	Empty .....11,000 lb.
Length .....52 ft.	Speed .....125 m.p.h.
Height .....20 ft.	Climb ...10,000 ft. in 12 min.
Surface .....1,905 sq. ft.	

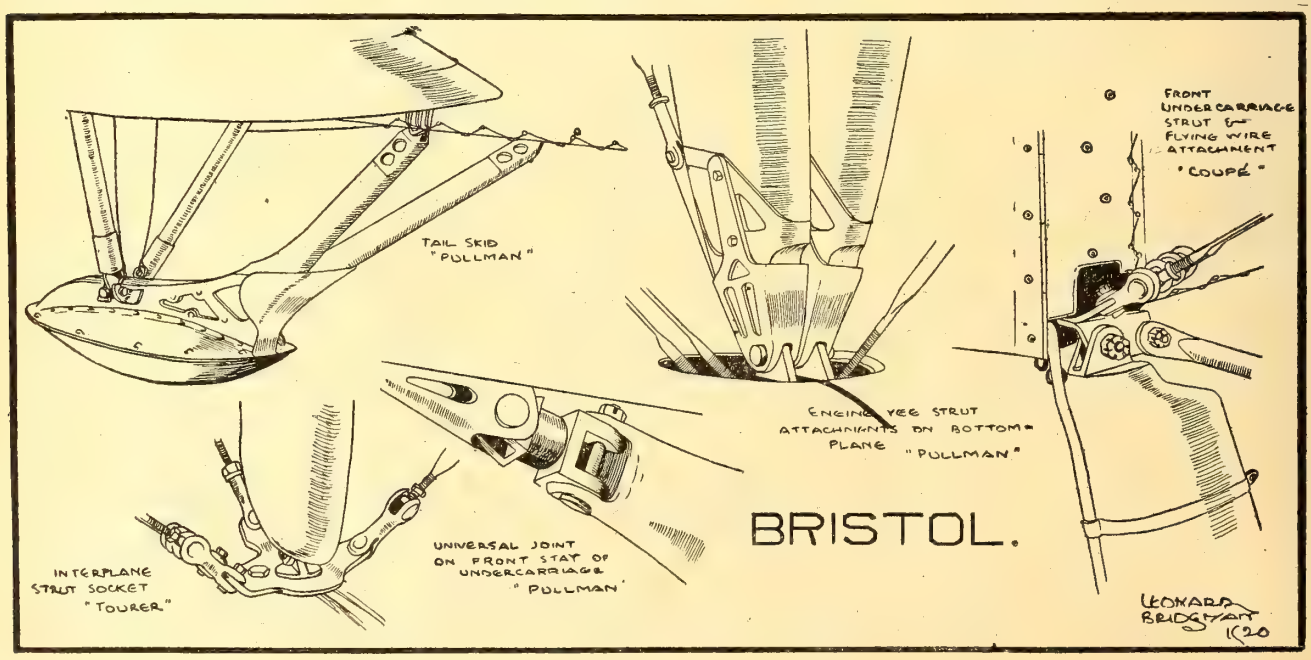
THE BRISTOL COUPE.

The "Coupé" is more or less one of the famous Bristol "Fighters" altered for peace purposes. One has always been of the opinion that a sword would make an extraordinarily inefficient ploughshare, and one is certain that a spear would never make a respectable reaping hook. Similarly one has never been a believer in turning war machines into passenger machines. All the same, the Bristol "Coupé" comes as near being a perfect peace machine as any transmogrified war machine can be.

Personally one has a dislike of being cooped in, so for a long cross-country flight one would prefer the Bristol three-seater "Tourer" to almost any three-seater machine one has seen, but those who prefer a closed-in machine will certainly like the "Coupé" as well as any three-seater in existence.

It has the advantage, which is not common to all three-seaters, that both the passengers face the engine. This, of course, means widening the fuselage, but it is doubtful whether this makes any material difference to the speed, as the fuselage aft of the cabin is as well streamlined as is possible. The lid of the cabin is held down by a very ingenious and simple clip, which can be released either from inside or outside. One would, however, like to see some species of emergency exit in the floor, so that the passengers could extricate themselves without trouble in the event of the machine turning over on landing and crushing the tail so that it became impossible to open the lid of the cabin.

The engine is a Siddeley "Puma." This engine has earned for itself a very high reputation for reliability in the course of the last two years. There was a time when engines of the B.H.P. design were regarded by pilots as unreliable, but



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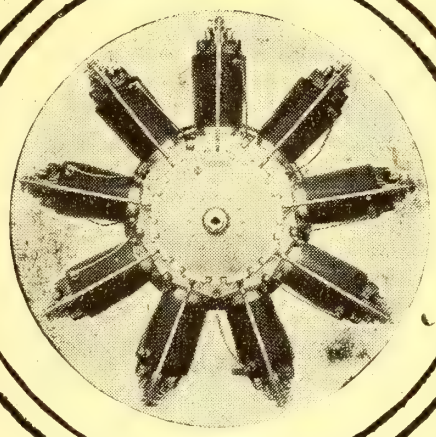


The Engine illustrated is the DRAGONFLY—340 h.p.—9 cyl. (Static Radial).

WALTON MOTORS, Ltd,
Walton-on-Thames.

Telephone:
ESHER 306 and 307.

Telegrams:
"MOTORS, WALTON-ON-THAMES."

experience showed that the unreliability was generally due to the pilots' habit of taking the machine off before the whole engine and the oil supply was thoroughly warmed. One of the most experienced pilots in the R.A.F., who has flown many thousands of miles over enemy country both in Europe and Asia, has told one that if only a pilot will run a B.H.P. or "Puma" engine for a minimum of 10 minutes on the ground before starting flying he will never suffer any trouble from loss of oil pressure or seizure of bearings. This being so, the Siddeley "Puma" seems to be an eminently suitable engine to fit in a touring machine.

The engine installation as a whole is very well done. A nose radiator of the ordinary type is fitted, and the radiator shutters, which are adjustable from the pilot's seat, are fitted in front of the radiator. The pilot's seat is so arranged that his eyes are six inches below and about six inches behind the rear top of the centre section, so that he can see comfortably all round and above him, and has quite as good a view as is necessary forward and downward.

Needless to say all the workmanship of the machine is up to the usual high standard set by the Bristol Company when it entered the Aircraft Industry ten years ago.

Specification of the "Coupe."

Span	39 ft. 5 in.	Engine	Siddeley "Puma"
Chord (top)	5 ft. 6 in.	Weight (full)	3,100 lb.
Gap	6 ft.	Weight (empty)	1,900 lb.
Length	26 ft.	Speed	115 m.p.h.
Height	9 ft. 6 in.	Climb	1,000 ft. in 15 min.
Surface	405 sq. ft.		

THE BRITISH AERIAL TRANSPORT CO., LTD., Conduit Street, W.1.

The British Aerial Transport Company show three of the well-known machines designed by Mr. Fritz Koolhoven—namely, a BAT "Bantam" of the F.K.24 type, a BAT limousine of the F.K.26 type, and a BAT "Crow," which was the last of Mr. Koolhoven's designs.

The BAT "Bantam" has already been described and illustrated many times in this paper. The particular machine shown is fitted with an A.B.C. "Wasp II" engine. This machine was admitted by many of the best pilots in the R.A.F. to be the handiest of all single-seater fighters produced during the war. Unfortunately, the "Wasp II" engine was not fully developed in time to be used on active service, and this fact, together with the usual delays, obstructions and obstinacies customary in the war-time Technical Department, prevented the machine from ever being used on active service. Nevertheless such eminent pilots as the late Peter Legh, Major Draper, and the late Roland Garros demonstrated in England, France, and Holland the supreme manœuvrability of the little machine. And recently the R.A.F. Test Station at Martlesham Heath issued a report admitting its excellence.

With the "Wasp II" engine, which now develops 200 h.p., the BAT develops a speed of 146 m.p.h. at 1,000 feet and has a climb of 1,700 feet in 16 min. 18 sec. with military load, which includes two machine-guns. The machine is shown exactly as it passed these tests.

It may be well to record that the fuselage is of the "Monocoque" type, constructed entirely of three-ply wood on oval formers supported by ash longitudinals. The advantage of the three-ply construction is that the fuselage can be practically shot to pieces in battle without crumpling as does the ordinary strut and wire structure. The engine itself is bolted to a duralumin back plate, and the accompanying cowling gives the finest possible form of streamline to the whole fuselage.

Specification of the B.A.T. "Bantam."

Span	25 ft.	Weight (full)	1,618 lb.
Chord	3 ft. 11¼ in.	Weight (empty)	953 lb.
Gap	3 ft. 3 in.	Engine	A.B.C. "Wasp II"
Length	18 ft. 5 in.	Speed	150 m.p.h.
Height	6 ft. 9 in.	Climb	10,000 ft. in 7½ min.
Surface	185 sq. ft.		

The "Commercial Mark I."

The BAT limousine, now known officially as the "Commercial Mark I," has also been described very fully in previous issues. It is undisputably the first aeroplane in the world designed expressly for commercial purposes. It is in no way an adaptation of a war machine. Also, as far as one can discover, it is the only British machine designed to carry four passengers and a pilot in a totally enclosed body. This fact is somewhat peculiar, for, on the good old principle that "two's company and three's none," it would seem obviously the right thing to build a machine to carry two couples.

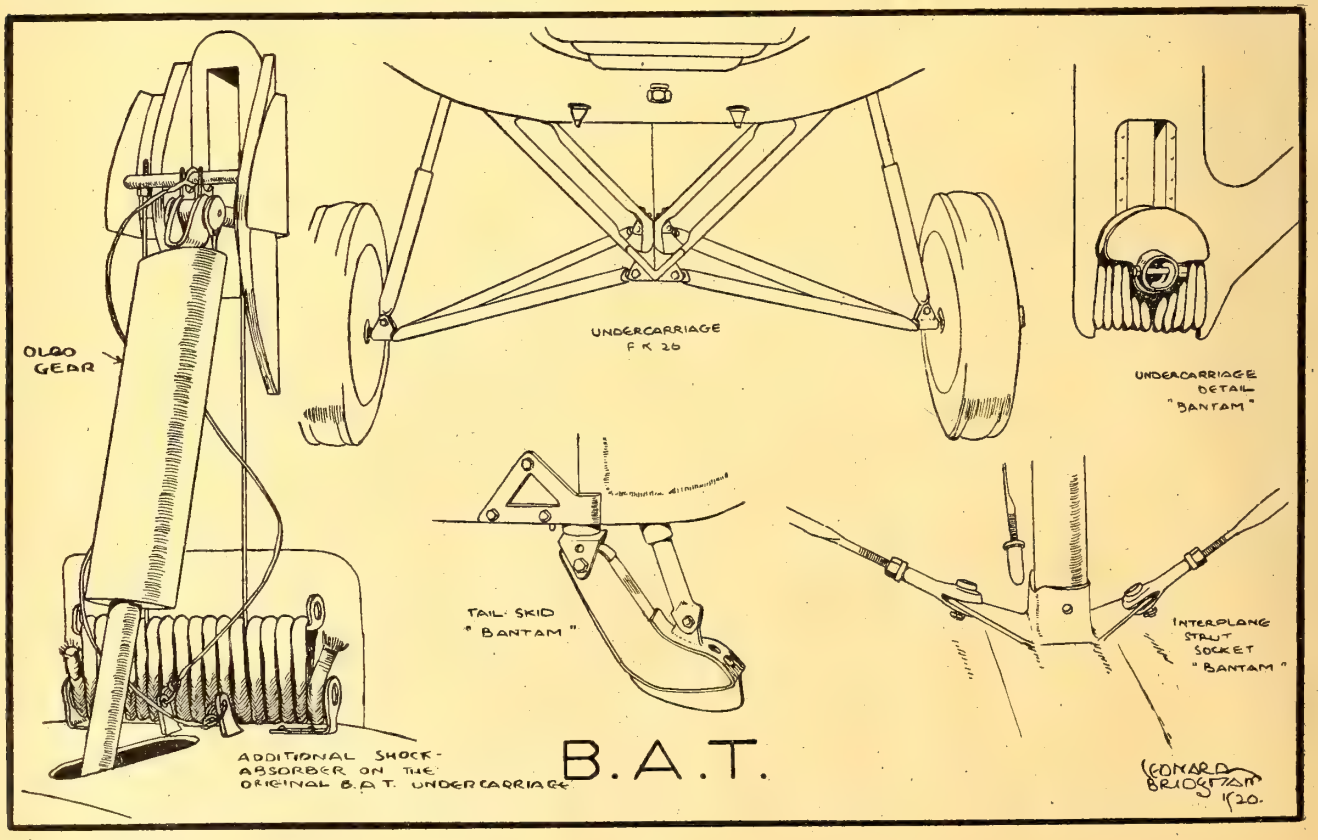
The extraordinarily clean design of the BAT fuselage probably accounts for her high speed and lift with comparatively low power. So efficient is the machine that she can carry a useful load of 1,000 lb. with sufficient fuel to give her six hours' flying at 110 m.p.h. with an "Eagle VIII" Rolls-Royce.

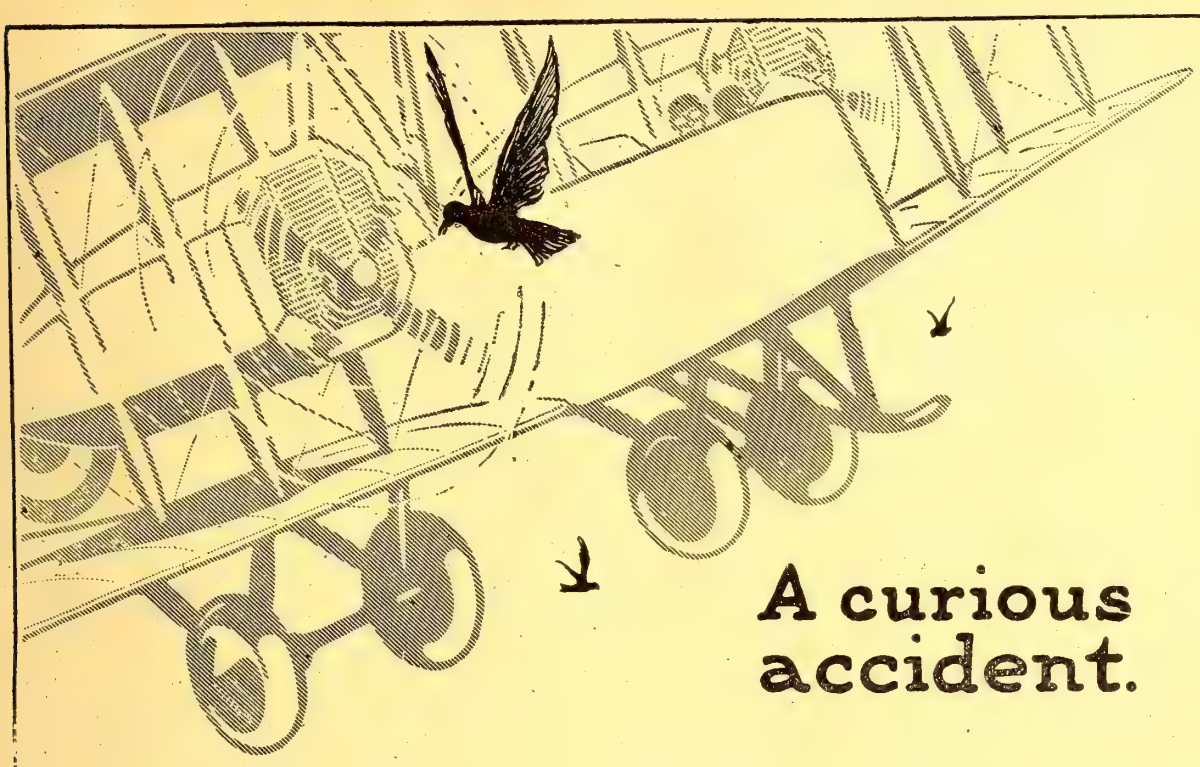
So far as one can discover, the only modification in this machine since its first appearance early in 1919 is that the oleo-pneumatic undercarriage has been rendered still more shock-proof by fitting it with supplementary elastic springing.

It will be remembered that the Instone Air Line recently acquired one of these machines for the London-Paris service.

Specification of the B.A.T. "Commercial."

Span	46 ft.	Gap	6 ft 6 in.
Chord	6 ft. 6 in.	Length	34 ft.





A curious accident.

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STAND NO. 33 AT THE AERO EXHIBITION, OLYMPIA, JULY 9-20, 1920.

Telephone No.: HAMMERSMITH, 2112.

St. James's 1.

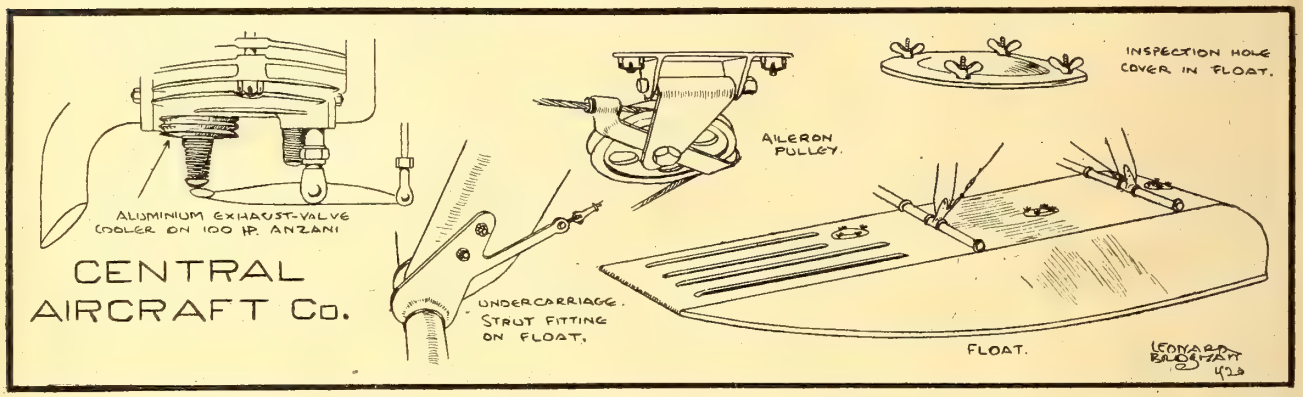
Height	11 ft. 3 in.	Engine	Rolls-Royce "Eagle" 350-h.p.
Surface	580 sq. ft.	Speed	115 m.p.h.
Weight (full)	4,500 lb.		
Weight (empty)	2,700 lb.		

The "Crow."

The BAT "Crow" is an amusing little machine which does certainly fly, though one can scarcely regard it as a serious aeroplane. In fact, it amounts to a motor-cycle sidecar body slung under a pair of wings, with a miniature engine, together with its tank, stuck onto the junction of the wings. The tail is carried on a pair of box-girder beams.

Major Draper flew the machine successfully at Hendon, though the engine was not at the time entirely satisfactory, and expressed the opinion that it was quite amusing.

THE CENTRAL AIRCRAFT COMPANY.

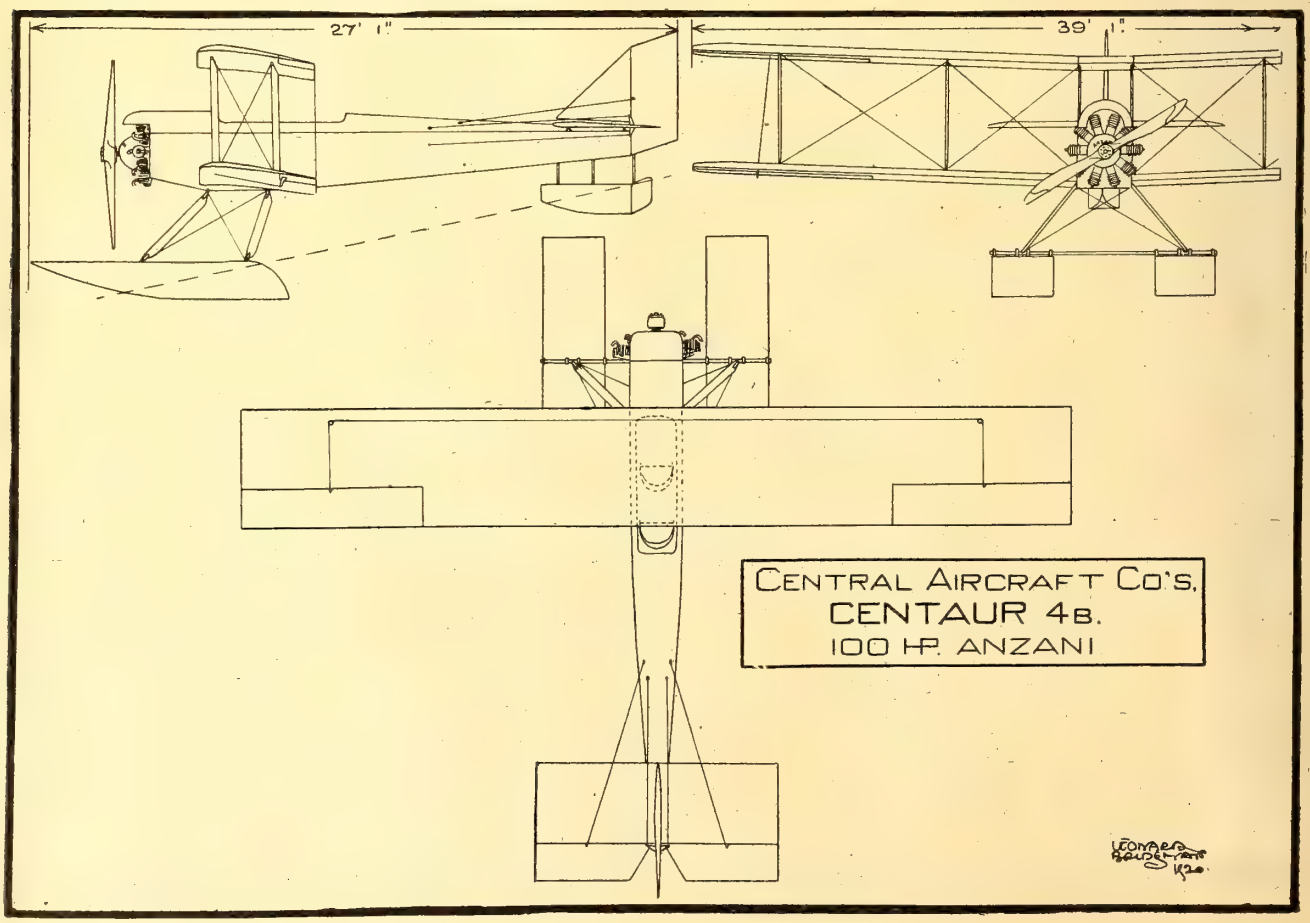


For a firm which has hitherto built only land machines to now embark upon the production of a seaplane is evidence of unexpected enterprise. To have produced at their first effort a seaplane fitted with an engine of low power which is—in the opinion of one of the best and most experienced of seaplane pilots—"very good indeed," is a very considerable achievement. In the Centaur 4b seaplane the Central Aircraft Co. have achieved this result.

Based in its aerial structure on the Central Aircraft Co.'s Centaur 4 land machine, the type 4b is a small tractor biplane of simple and robust construction, very lightly loaded as to wing surface, and in consequence capable of carrying nearly 19 lb. per h.p. at a moderate speed, with no signs of sluggishness in her flight. Obviously, however great may be the advantages of a power loading of less than 10 lb. per h.p., machines possessing it are not good dividend-earners.

To the aeroplane proper there are attached twin floats of the well-tried stepless pontoon type, and a tail float. The floats are carried by a chassis of oval steel tubes, four of these serving as struts and two others as cross members. An ample water surface is provided, and a correct position of float has been secured, and in consequence the machine is quick to get off and easy to handle in alighting.

In construction—as has already been remarked—the machine is simple and robust. The fuselage is of ash and spruce longerons, with spruce struts, steel fittings, and tie-rod bracing. The engine—air-cooled and thus free from radiator complexities—is bolted to a rigid plate forming the fore end



THE FAIREY AVIATION CO., LTD.,

Contractors to the Admiralty,
War Office and Air Ministry.

Head Office, HAYES, MIDDLESEX.
London Office, 175, PICCADILLY, W.1.

Works, Hayes, Middlesex, and Hamble, near Southampton.

Designers and manufacturers of Seaplanes, Flying Boats and Aeroplanes.

Patentees of the Fairey Patent Variable Camber Gear for Aircraft.

Sole Licensees of the Linton Hope Patent Hull for Flying Boats.

Designers, by special request of the British Government, of the "Atalanta" type Flying Boat, the largest of its kind constructed.

The following types of Fairey Seaplanes designed for the British Government have been put into production for Service use:—Fairey Campania, Hamble Baby—type IIIA, type IIIB, type IIIC.

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Telephone—19 Hayes, Middlesex.

Telegrams—"Airily, Hayes, Middlesex."
Code—A.B.C. 5th Edition.

of the structure, with behind and above it the petrol and oil tanks. Aft again, and extending from the front centre sections struts to well behind the wings, is one long cockpit, divided by a cross strut at the rear centre section struts. In the forward part of this are seated the two passengers : aft, the pilot is provided with all the necessary controlling mechanism. Thence the fuselage tapers to a vertical knife edge, and is furnished at its rear with the usual tail, whereof it may be noted that the fixed stabilising surfaces, fin and tail plane, are of very ample size and serve to give to the machine a very large but not unduly great degree of stability. Incidentally, it would appear that rudders and elevators on this machine are interchangeable.

The wing structure is a biplane, of equal span and chord in its two members, devoid of stagger, and equipped with ailerons on both planes. Two bays, with profiled spruce struts and cable bracings, are on each side, top and bottom wings on each side being identical in form and size—the centre section, therefore, is of a width equal to that of the fuselage.

Specification of the "Centaur" 4B.

Span	39 ft. 1 in.	Weight, loaded	1,900 lb.
Gap	5 ft.	Useful load	320 lb.
Chord	5 ft.	Engine	100-h.p. Anzani
Length overall	27 ft. 1 in.	Petrol capacity	24 gals.
Height	9 ft. 6 in.	Endurance	3 hr.
Surface	380 sq. ft.	Speed	40-75 m.p.h.
Weight, empty	1,230 lb.		

THE FAIREY AVIATION CO., LTD., Hayes, Middlesex.

The machine exhibited by this firm presents certain difficulties to the writer who would describe it.

The details of the design are bristling with novel and ingenious features, but either they may not be described because the Air Ministry forbids, or they cannot because Mr. Fairey has as yet had insufficient time to file his patent specifications and one may therefore not view them too closely.

But even so the machine shows many interesting points. The first thing that is noticeable is the immense size of the floats compared with the remainder of the machine. The Fairey firm know too much about floats to overburden their machine with superfluous buoyancy, and a rough calculation leads to the conclusion that this quite small machine must weigh, in flying trim, something of the order of 5,000 lb., if not more.

This is confirmed by a suggestion from an authoritative source that the wing loading approaches 12 lb. per sq. ft.

The peculiar fuselage and tail arrangement also attracts attention at once. Aft from the rear cockpit the fuselage remains of constant and very considerable depth, with its top line practically on the level of the top wing. Tail plane and elevators are mounted upon its upper surface, with a rudder extending very slightly above the tail plane, but extending downwards over the depth of the fuselage and of the tail float which is attached directly to the underside thereof.

These two striking features noted, one observes that the machine is a two-seater, pilot in front, machine evidently intended to be capable of defence, if not of offence. The pilot seated normally with his head well above the upper centre section is provided with a synchronised Vickers gun, firing forward, the observer close up behind him has the ubiquitous Scarff gun ring.

Ascent to the seat gives a partial explanation of the curious tail arrangement, for it is at once seen that it allows of a clear field of fire backwards, and an inspection of the pilot's seat discloses the fact that, although he is raised to have a clear view over the top plane, he can at need, by pulling a lever, drop some five inches and secure below that plane an excellent view for landing.

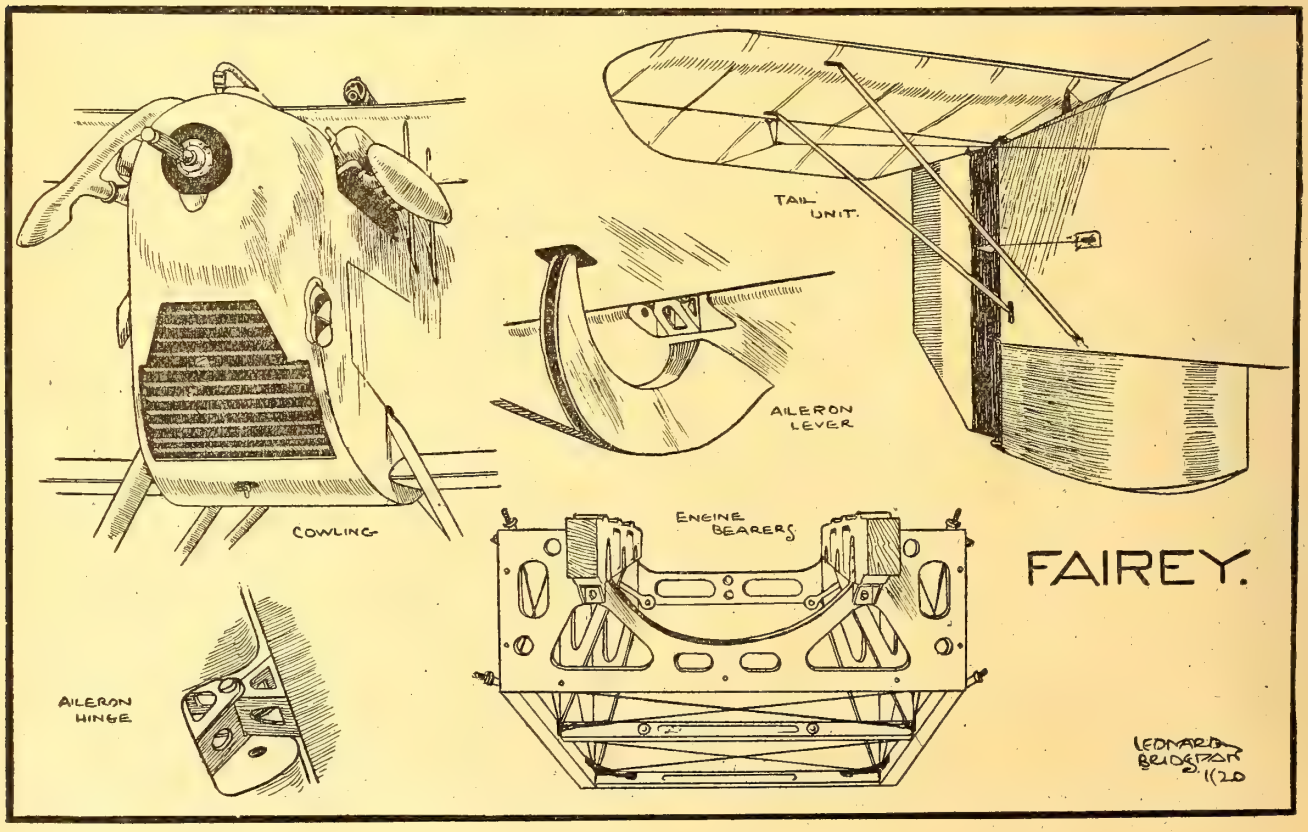
The fuselage is unique in its construction. It is built in two entirely separate parts—a nose-piece carrying the engine, and a tail-piece which runs from aft the wings to the tail and carries the two seats and their attendant appliances. Between these two there intervenes merely a cased-in portion of what is really the central unit of the machine, built entirely of steel and including top and bottom centre wing spars, their connecting struts, and all wing and chassis attachment fittings.

The two fuselage sections are attached by bolts to this central unit, and may be removed bodily without disturbance to any other portion of the machine. In their construction nothing but straight pieces of timber—straight from the thicknessing machine in most cases—are employed, together with a very small variety of standardised fittings.

The aft end, indeed, has actually nothing but spruce longerons and struts of uniform section cut off to length in a jig, and aft the observers' seats there is, except for the tail fittings, but one form of fitting.

There is no wire bracing athwartship in this part of the fuselage—instead, spruce stiffeners forming a complete diamond are built onto the struts at each bay.

The wings, which are of the folding type, are extremely similar to those of the Fairey type 3. They are of equal span and chord, staggered, and fitted with the Fairey



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patent variable camber gear, which consists of adjustable trailing edge flaps operated so that they effectively vary the wing camber by a handwheel in the pilot's cockpit.

With the flaps in their normal position a high efficiency wing section is available with all the possibilities of high speed which attend thereon. With the flaps pulled down a heavily cambered high lift section appears, and a low landing and getting-off speed is possible, despite heavy wing loading.

In this particular case the camber gear has new features. Firstly the flaps themselves have semi-circular fore-edges, which, whatever be the position of the flaps, leave a fair line of flow over the whole wing surface. These flaps are pivoted, on overhanging hinges, from the rear spar, at the centre of the semicircle forming this edge, and as this semicircle is of considerable radius, the hinge point is appreciably within the edge of the flap—which reduces the moment about the hinge and amounts to a partial balancing in effect.

Then the camber changing handwheel has upon the same spindle the handwheel for the tail plane adjusting gear. The tail-plane adjuster may be either moved independently to trim the machine, or it may be interlocked therewith. This done, operating the camber gear alters the tail plane setting to just compensate for the movement of the centre of pressure which follows the change of camber and, the machine once trimmed, the camber can be varied without trimming

As the machine appears it is a seaplane, though it is said to be of the amphibian type, and one assumes, therefore, that the amphibian part of the gear is so far to remain secret. Of the exact purpose for which it is designed one is told nothing with great emphasis. It may suffice that the machine is—as has already been noted—equipped for fighting. Taking the rough estimated weight of 5,000 lb. already arrived at together with the fact that the Napier engine, wherewith it is equipped, will give 500 h.p., it appears that the weight per h.p. is in the neighbourhood of 10 lb. 10 lb. per h.p. and 12 lb. per sq. ft. on an efficient wing section should mean speed—between 130 and 140 m.p.h. seems reasonable.

Even with 12 lbs. per sq. ft., on Fairey wings, a low getting-off speed, and with the h.p. available, a quick get-off seems likely. Can it be that the R.A.F. have at last decided that flying land machines from a ship's deck and losing them in the sea is a wasteful and unnecessary proceeding? Whatever may be the designed purpose the machine is eminently suitable for sea patrol from seaplane ships, and one hopes that it may herald the revival of the long-neglected seaplane.

Specification of the Fairey Amphibian.

Span	40 ft.	Height	11 ft. 6 in.
Chord	6 ft.	Surface	440 sq. ft.
Gap	5 ft. 9 in.	Engine	Napier 450 h.p.
Length overall	30 ft.		

The Air Ministry prohibits the publication of further data.

MARTINSYDE, LTD., Woking.

The Martinsyde Type "A."

In designing the Type A as their first purely commercial type aeroplane, Martinsyde, Ltd., have carefully considered the pros and cons of various types and sizes of aircraft and have settled upon what may properly be described as a happy mean. Believing as the firm does that until the multiple-engine type has been developed to a much greater degree of reliability than at present the single-engined machine is the more reliable, they naturally have confined themselves to this type.

As engine reliability is a *sine qua non* for such purposes as this is desired for, an engine of round about 300 h.p. was indicated as roughly the limit—not that there are no reliable engines of greater h.p., but that at about that power there existed a number of tried and trusty engines. A larger power had involved a more restricted choice and a greater chance of failure of engine supplies.

This machine was designed specifically for high-speed passenger- or freight-carrying work, and is of the smaller class of commercial aircraft. Martinsyde, Ltd., do not believe that at present the multiple-engined type of aeroplane has been developed to a stage at which it can compare in reliability with the single-engine type.

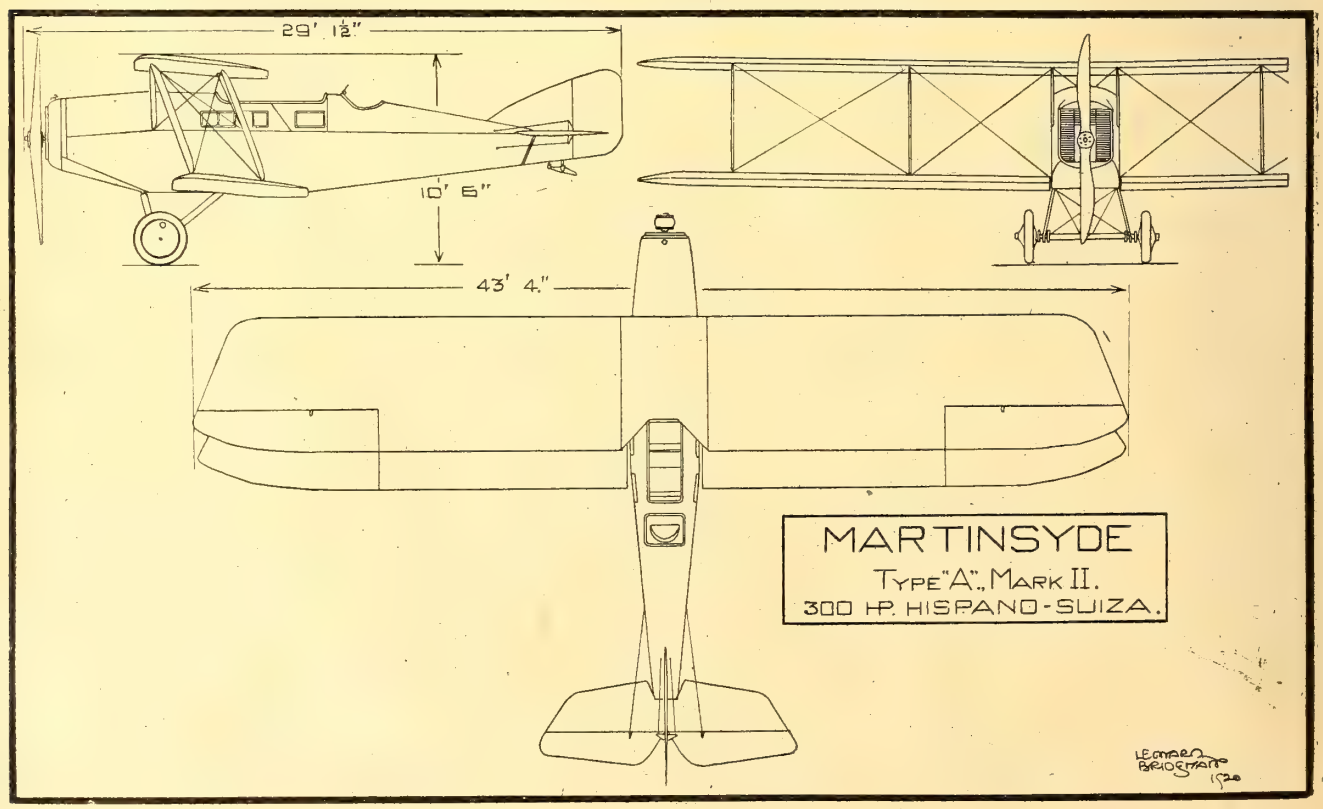
This fact and the desirability of designing for an engine h.p. which could be provided by two or three different types of tried and proved engines limited the power to the neighbourhood of 300 h.p., and—high speed being the essential feature of aerial transport—the power limit imposes a limit to the machine dimensions.

Actually there would appear at the present time to be more immediate useful employment for a machine of about this size than for either much larger or much smaller types, and with the combination of high performance and good load-carrying capacity which it possesses the type A Martinsyde should prove to be one of the most generally useful machines yet built.

It can be built as either a passenger carrier or as a freight machine, carrying pilot and either four passengers or freight to a total of 1300 lb., or any intermediate combination of freight and passengers, together with 80 gallons of petrol and 8 gallons of oil—sufficient for a range of 500 miles or more.

The Rolls-Royce "Falcon" engine of 275 h.p., and the Hispano-Suiza 300 h.p., are the two standard engines which have so far been fitted to the type.

The exhibition machine is fitted with the 300 h.p. Hispano



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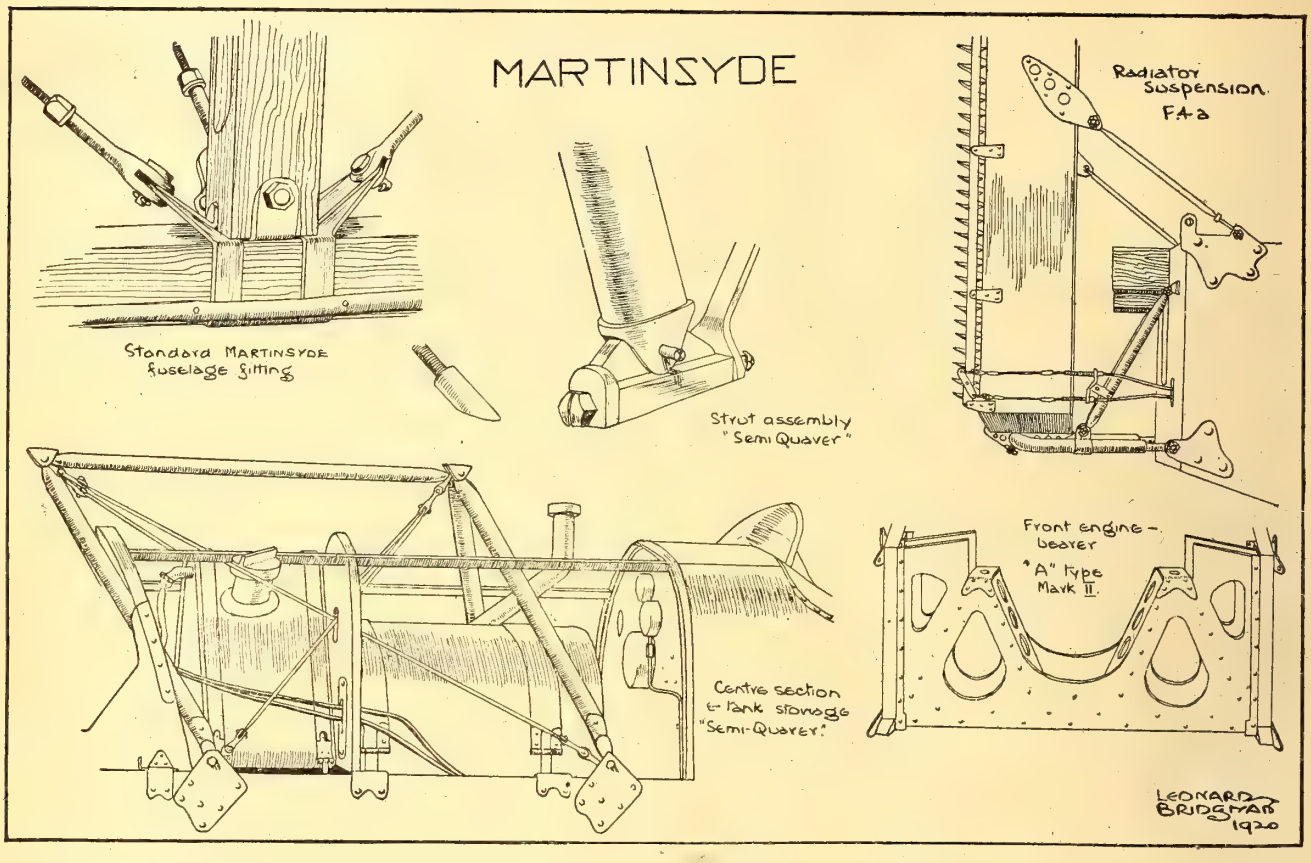
We are exhibiting this machine at Stand 63.



engine, and is equipped for pilot and four passengers, and is shown with a land undercarriage—a separate and interchangeable float undercarriage for the same machine can be supplied in addition.

The type A is of the normal tractor biplane type, with staggered, equal top and bottom planes, having two rows of interplane struts aside. Passengers or freight are accommodated within the fuselage from beneath the centre section to well aft the wings, with the pilot's cockpit nearly halfway to the tail. The tail contains the normal organs, a tail plane with divided elevators, the whole being in plan of a truncated trapezoidal form, a nearly triangular fin, and a rudder which can be most nearly described as a quadrangular affair with two corners and two rounds off.

In the construction of this machine very great attention has been given to the accessibility of the engine and all such other parts as may need inspection, and to the ease of replacement of damaged parts. All fittings throughout are standardised and are drilled to jigs—spare parts are therefore certainly interchangeable.

The fuselage is built of spruce throughout and is of the usual braced girder type. It is unusual in that it is made in four sections: the nose with engine bearers, which extends to the forward undercarriage strut, the cabin section extending thence to aft the main planes, and the tail portion, containing pilot's cockpit and extending to the tail post. Each section is readily removed and can be replaced by a complete new section, or minor repairs may be carried out with ease. One great advantage of this form of construction is that anything of the nature of sharp bends in the longerons is avoided, the portion within each section is practically straight, and spruce can be used throughout without fear of weakness at bends.

Aft the pilot's seat all the fuselage fittings are of a single type, which is standard throughout the range of Martinsyde machines. This fitting embraces the longeron, which is not pierced by any bolt.

The front section and the cabin section of the fuselage are three-ply covered, and not wire braced, the three-ply glued and screwed to the framing and reinforced at each joint by external duralumin fishplates. The engine bearer brackets are substantial built-up duralumin affairs, which like all the other fittings are built to jigs and can therefore be replaced from stock. The top rail of the fuselage throughout is nearly horizontal and is approximately at the level of the airscrew shaft, the whole of the structure above it being of the nature of a fairing.

The wings are built on laminated spruce spars, the laminæ glued together and bound with doped fabric. All the interplane strut fittings are of the type which pass right round the spars, and they are located by a single bolt on the neutral plane thereof. On the face of the spar to which the struts approach the projecting tongues of the strap surrounding the spar have between them a duralumin packing block butting upon the spar and formed into a tongue over which the forked terminal of the struts fits. The main bracing wires are taken from lugs on the main fittings in such a manner that the intersection of the centre line of the strut and of the bracing wire coincides with the neutral plane of the spar. The so-called "incidence bracing" is carried by an extension of one of the tongues which carry the strut packing block. The general dimensions and performance of the type A Mark II exhibited are given hereafter:—

Specification of the Martinsyde Type A.

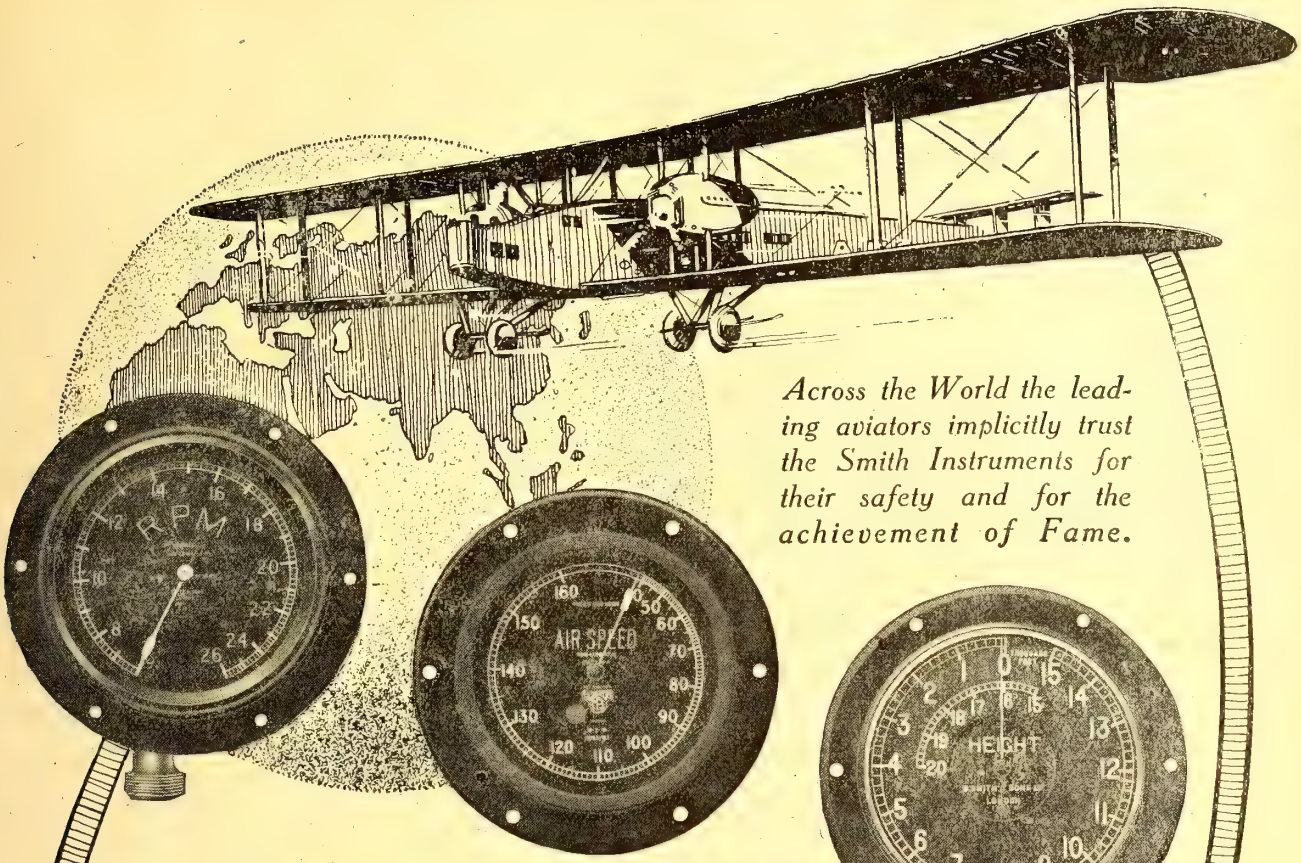
Machine type ...Martinsyde Type A, Mark II	Total wing surface 520 sq. ft.
Purpose Passenger transport	Fuel and oil capacity 88 gal.
Capacity .....4 passengers	Weight loaded .....4,000 lb.
Engine ...300 h.p. Hispano-Suiza	Load per sq. ft. .....7.75 lb.
Span .....43 ft. 4 in.	Load per h.p. .....14.5 lb.
Length overall ...29 ft. 1¼ in.	Maximum speed ...115 m.p.h.
Height (less airscrew) 10 ft. 6 in.	Cruising speed .....100 m.p.h.
Chord .....6 ft. 6 in.	Landing speed .....40 m.p.h.
	Endurance at cruising speed...5 hr.
	Range .....500 miles

The Martinsyde F.4a.

The Martinsyde F.4a is a two-seater adaptation of the famous F.4 single-seat fighter. In this guise it serves either for high-speed touring, for express mail carrying, or fitted with dual control provides the finest possible training in the handling of really high-performance machines.

As a two-seater, and shorn of guns and their gear, the machine has substantially the same performance as the single-seat fighter, which is to say that it has a range of nearly 300 miles at 142 m.p.h., and can climb at an average rate of over 1,000 ft. per min. to any height up to certainly 16,000 ft.

The constructional details are very similar to those of the other Martinsydes. The fuselage is of spruce, with solid longerons, in practically straight lengths, with joints where changes of direction occur. The front end is three-ply covered with the Martinsyde duralumin fishplate reinforcements at all joints, the aft end is of braced girder type with the Martinsyde standard fuselage fittings. The wings similarly have the same constructional features as those of the type A,



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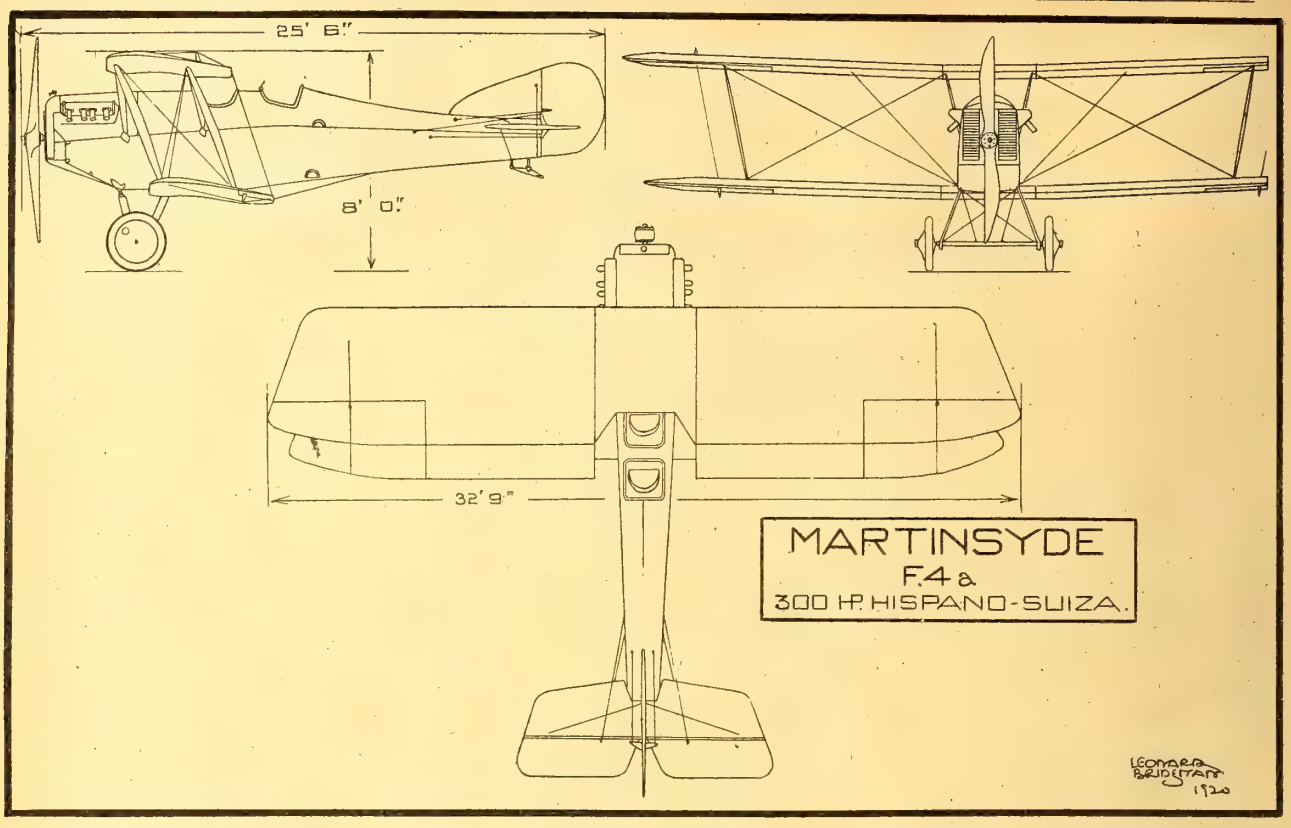


laminated spars, strap type interplane fittings, etc. The space between the front spar and the leading edge is, in this and in other fast Martinsydes, covered with a thin three-ply strip which prevents the sagging of the fabric between ribs.

Alongside the machine itself is to be seen a float undercarriage which is interchangeable with the wheeled one attached. This is of the twin-float type, the floats proper being of considerable length aft the step, and thus needing no tail float. In form they are of the pontoon single step type, and are very simply but strongly constructed on thoroughgoing longerons with sewn "Consuta" plywood skins.

Specification of the Martinsyde F.4a.

Engine	300-h.p. Hispano-Suiza	Cruising speed	115 m.p.h.
Wing span	32 ft. 9 in.	Landing speed	44 m.p.h.
Length overall	25 ft. 6 in.	Load per sq. ft.	7 lb.
Height (minus airscrew)	8 ft. 10 in.	Load per h.p.	7½ lb.
Weight (loaded)	2,300 lb.	Useful load	100 lb.
Petrol capacity	36 gall.	Seating capacity	1 pilot, 1 passenger
Oil capacity	4 gall.	Endurance	2½ hr.
Water capacity	10 gall.	Range	295 miles
Full speed	142 m.p.h.	Ceiling	25,000 ft.

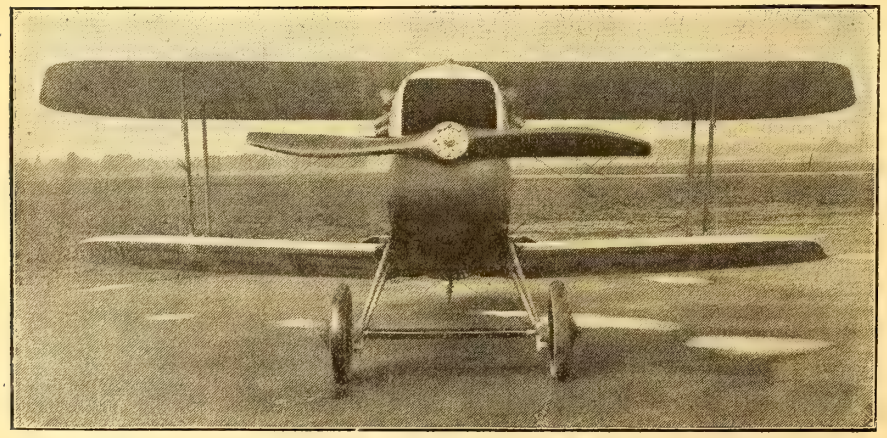
The Martinsyde "Semi-Quaver."

On the occasion of the 1919 Aerial Derby, Mr. Handasyde was heard to remark, apropos the F.4 machine which was there competing, that "that was no machine for racing it was too big to be fast." In the "Semi-Quaver" an effort has been made to repair this deficiency, and to produce a real speed machine. For the purpose of testing the type an experimental "Semi-Quaver" was fabricated, using an existing fuselage, and this machine put up an official speed record of 161 m.p.h. The machine has been reconstructed, a fuselage has been built for it, and there is no doubt that this speed will be notably increased.

In so far as construction is concerned this little machine follows Martinsyde standard practice. The construction of the fuselage is, on a small scale, that of the type A in its main features. Straight sections of spruce are used for longerons, the changes of line being effected by joints. The engine bearer arrangements are very like those of the type A, and the engine itself is the same.

Aft the engine compartment is the tankage—all stowed about the centre of gravity. A sketch shows how compactly yet accessibly these items are arranged. Aft of the pilot's seat standard Martinsyde fuselage fittings are used throughout.

Unlike all other Martinsydes there is no centre section. The upper wings meet at the apex of a pair of inverted Vees, forming a cabane; the lower wings spring from wing roots built onto the fuselage side and merged into the fuselage in easy curves. The upper wing is of greater chord and span than is the lower one, and the wings are heavily staggered. Both sets of wing tips rake outwards heavily from leading edge to just aft the rear spar and the trailing edges are raked forward, so that in effect the wings have almost pointed tips.



A front view of the little racing Martinsyde—the "Semiquaver." With a wingspread of just over 20 ft., with 6.8 lb. per h.p. and 13.8 lb. per sq. ft., and the very obvious lack of head resistance, this little machine is amongst the fastest in the world. Although certain other aeroplanes officially have a speed some four or five m.p.h. faster, it must be remembered that 1/19 second over the standard kilometre course accounts for such a difference.

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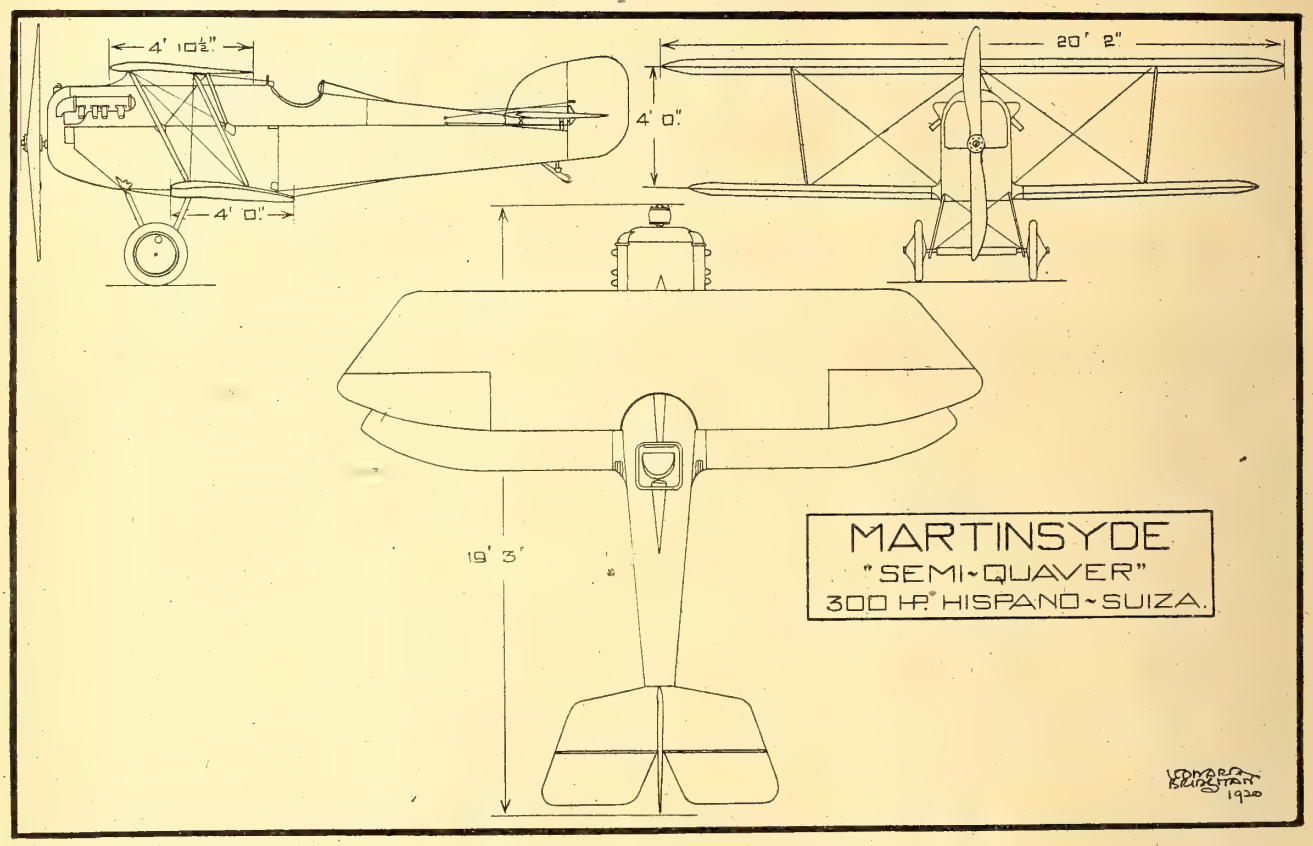

All bracing wires in the open are of the streamline type, and the terminals, except for the adjustment nuts, are concealed within the fabric of the wings.

Streamline section steel tubes are used for interplane struts, attached to the wings in a manner similar to that used on the type A machine. These struts slope outwards upward, in accord with the differing size of the upper and lower wings.

The undercarriage is of the standard Vee type—the struts of oval steel tube—and the axle is undivided. Painted in the Martinsyde racing colour of vermilion, the machine has the air of speed.

Specification of the Martinsyde "Semi-Quaver."

Span .....20 ft. 2 in.	Engine ...300 h.p. Hispano-Suiza
Chord, top .....4 ft. 10½ in.	
Chord, bottom .....4 ft.	Weight, fully loaded 2,000 lb. (approx.)
Gap .....4 ft.	
Length overall .....19 ft. 3 in.	Speed ...60 to over 160 m.p.h.
Height (excluding airscrew) 8 ft. 2 in.	Climb ...3,000 ft. in 1st min.

HANDLEY PAGE, LIMITED, Cricklewood.

The products of the Handley Page firm have been so frequently described in this paper that it is quite difficult to say anything new about them. The W.8 which is on view at Olympia is the same machine that was shown at the Paris Show after her maiden voyage. Since that time she has made a number of trips to Paris in what must certainly be record time for a twin engine machine, and she has further distinguished herself by breaking the world's record for weight lifting.

However, for the benefit of the uninitiated it is necessary to give a general description of the machine once more. She is described by the firm as a medium-sized twin-engine biplane, specially designed for commercial use, having an exceptionally large carrying capacity and reserve of power. This description is both embracing and accurate for she is smaller than the big four-engined Handley Page and bigger than some of the high-speed twin-engined war machines.

Her cabin arrangement is altogether excellent and resembles a comfortable railway carriage. As the cabin extends right from the bow to about three-quarters of the way along the fuselage she is capable of carrying, instead of passengers, a very large bulk of cargo, so that light and bulky goods can be carried profitably.

Her two Napier engines of 450 h.p. each provide her with ample power for her size, so that the engines need hardly ever be used at full power, with the result that their life can be considerably prolonged. As the wings are arranged to fold like those of the original Handley Page, the machine can be stored in a comparatively small shed, despite her large size.

The general lines of the machine resemble on a small scale those of the four-engined Handley Pages rather than those of the original two-engined machines. For example, the spans of the top and bottom planes are equal, and the lower plane only has a dihedral angle. The ailerons are fitted on the Handley Page patent system of balance whereby the leading edge is in advance of the aileron hinges. This makes the machine very much easier for the pilot to control, and one is told by those who have flown the machine that she is in fact quite as easy on her lateral controls as is many a single-engined machine, despite her 75 ft. span.

One is told that it is proposed before long to fit this type of machine with the new Handley Page patent plane system which should give her immense lifting power and a very low landing speed. Thus fitted she should undoubtedly be one of the most efficient and one of the safest machines in the world.

A point worthy of attention by visitors to the Show is the method in which the engines are carried. These are slung on overhung frames from the centre section instead of being carried direct on the wing structure. In this way the propeller centres are kept the necessary distance apart while reducing to a minimum the overall width between the hinges on which the wings are folded.

The system has the further advantage that the engine and petrol tank can be removed from the machine by a direct lift over-head.

The fuselage is narrowed down in front so as to allow the airscrews, which are tractors, to come as close together as possible. This reduction of the distance between the airscrew centres naturally gives much easier control if one engine cuts out suddenly, and so the danger of a spin caused by the failure of one engine is practically abolished.

A point of considerable interest to those who propose to use these machines on air lines is the fact that in each bay of the wings the front and back struts are identical as also are the bracing wires. This naturally reduces very considerably the number of spare parts which have to be carried.

Another interesting point is the fact that the kingposts of the ailerons are fitted between the planes and do not project above the upper plane or below the lower plane. This is a distinct saving in overall height and the possibility of damage owing to the kingposts hitting an obstruction when on the ground is abolished. The control wires of the ailerons are

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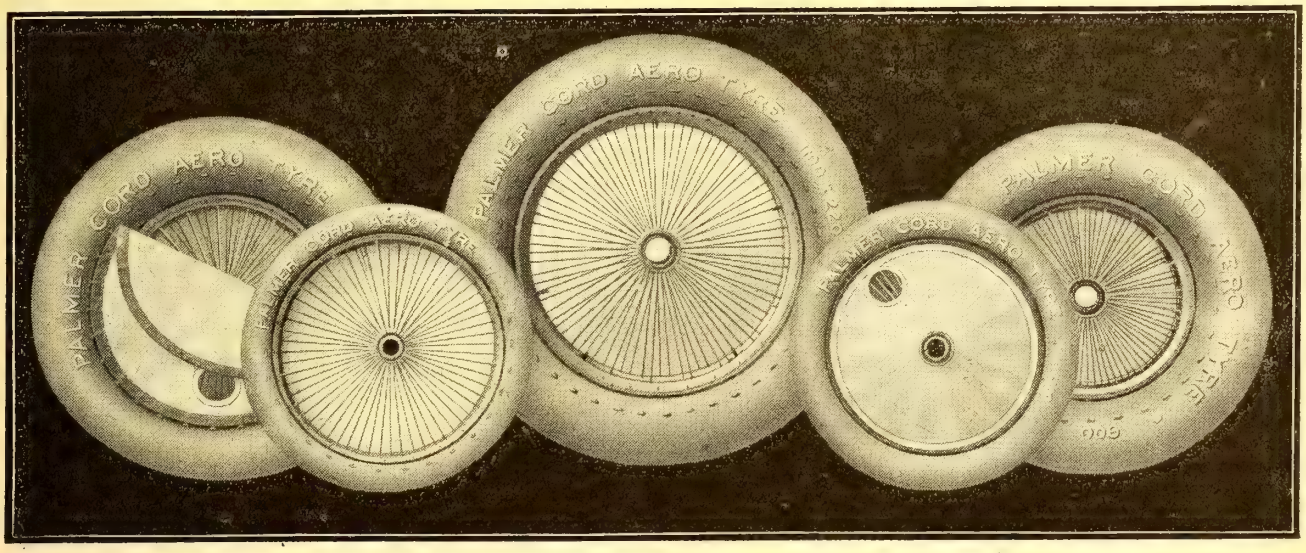

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Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104 46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104 46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135 50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132 46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132 46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135 50
,,	*40	185.	60.32	135 50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125 60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
1500×300	115	304.8	101.6	Central
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carried below the lower plane where the parts most subject to wear can be easily inspected.

The upper and lower main planes outside the hinges are assembled in one piece, but in fact the spares are jointed midway along the complete wing cellules so that the size of individual planes is reduced for use of transport and storage and in the event of a wing tip being damaged the part of the wing to be replaced is small and therefore less expensive than if the whole wing were in one piece.

Particular attention is directed to the main spar fittings of an entirely new type in which no fork ends are used in connecting the wires.

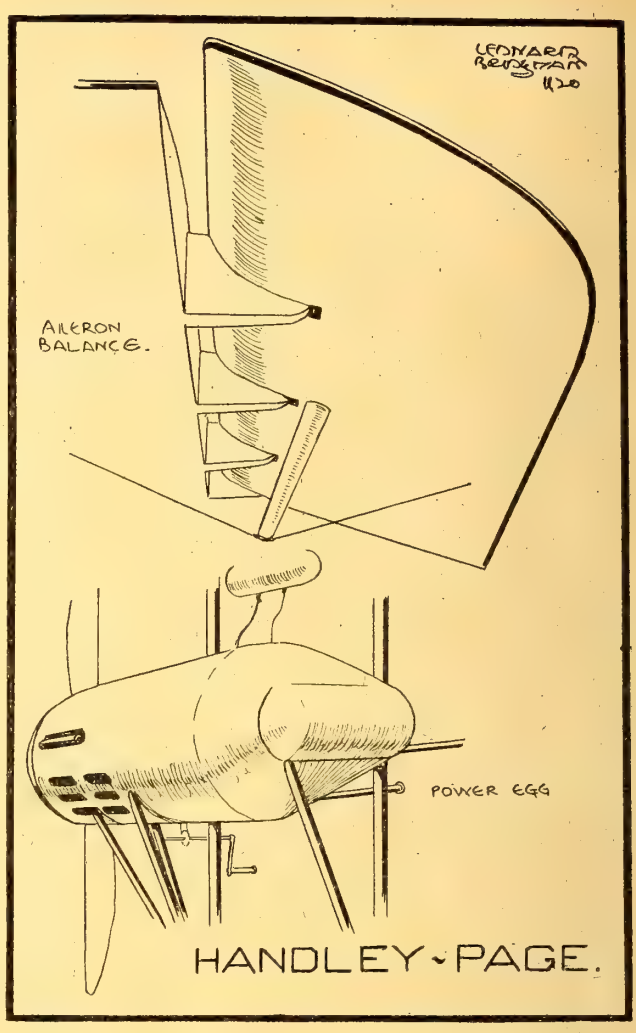
The fuselage is constructed in three sections which also facilitates repairs and replacement as in the case of the wings. The front section includes the pilot's cockpit with all instruments and controls. The second section comprises the passenger saloon and cargo space as a complete unit, and the third section includes the rest of the fuselage from the aft end of the saloon to the rudder post.

The objection to carrying petrol tanks in the fuselage does not exist in these machines, for the tanks are built in the engines nacelles so that if there should happen to be a fire it is a considerable distance away from the fuselage. Still further to diminish the danger of fire, a fireproof partition is fitted between the tank and the engine, so that it is practically impossible for any carburetter fire to set light to the main petrol supply. This is a most consoling thought for aerial passengers.

The undercarriage is similar in design to those used with success on the four-engined machines. It consists of two entirely separate units, each of which has two wheels, one below the engine and the other below the fuselage, on either side. All members of this undercarriage unit have universal joints so as to allow movement in any direction. As no portion of the undercarriage is directly below the fuselage it is possible to drop mails, parcels, etc., through the floor of the fuselage without danger of their catching in the undercariage. The whole machine displays deep thought and very great skill in design and the construction is fully up to the highest standard which one expects from our leading aircraft manufacturers.

Specification of the "W.8."

Span	75 ft.	Weight full	(not available)
Chord	10 ft.	Weight empty	(not available)
Gap	(not available)	Engines	Two 450-h.p. Napiers
Length	60 ft.		
Height		Speed	(not available)
Surface	1,500 sq. ft.	Climb	(not available)



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It must have been of Avros that the poet wrote that "age cannot wither nor custom stale their infinite variety." At any rate, the fact that the 80 Gnome "Avro" of the 1914 Show was in all outward seeming exactly like to the Renault engined three-seater which appears at this will in no wise detract from the interest of the present exhibit.

Nor does the fact that the Avro triplane "limousine" is almost entirely assembled of the same particles which compose the Avro, which every ex-R.A.F pilot—and numbers of others—knows so well, deprive it of its claim to be regarded as a sample of the modern highly efficient commercial aeroplane.

Still less does the fact that the "Baby" is equipped with the 35-h.p. Green engine, wherewith Mr. Pixton and the late Lieut. Parke, R.N. were wont to disport themselves of week-ends in 1911 and 1912, remove any of the romance from the fact that with that engine and on that machine Mr. Hinkler flew from England to Rome and back in 35½ hours flying time with a fuel consumption of 75 gallons.

The Renault-Engined Avro Three-Seater.

This machine is a modification of the Standard Training Biplane, Type 504K, and retains the excellent aerodynamic qualities of that well-known machine.

The modifications consist of removing the dual control and providing accommodation for seating two passengers in tandem behind the pilot, who controls the machine from the original front cockpit.

The nose of the fuselage is modified to provide a suitable mounting for the 80 h.p. air-cooled Renault engine, which is well known for its reliability and economy in fuel consumption.

The standard fuel tank is replaced by a petrol tank in the centre section, which position, of course, is ideal for a gravity feed to the carburetter, thereby eliminating the complication of a "pressure feed" system.

The machine is admirably adapted for economical touring, up to a range of 200 miles, and for joy-riding it possesses the same qualities of low landing speed and controllability

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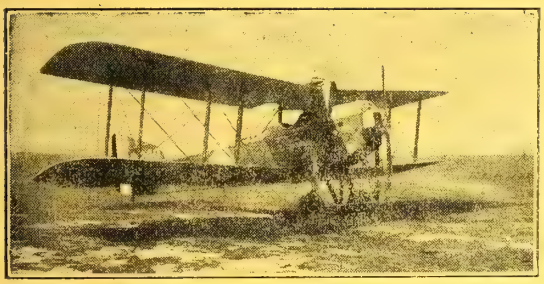

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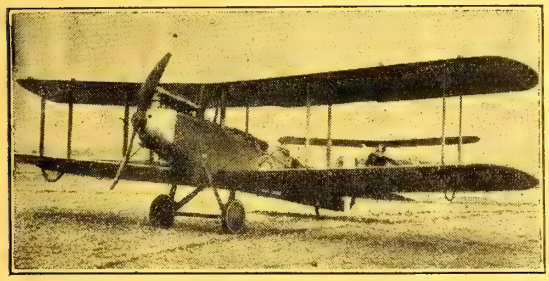

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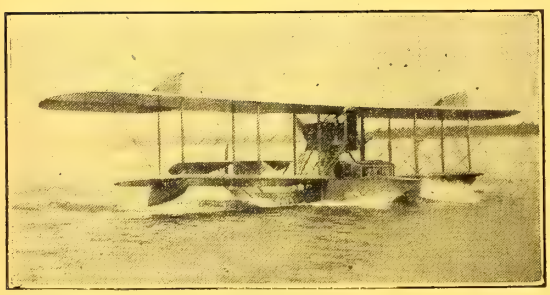

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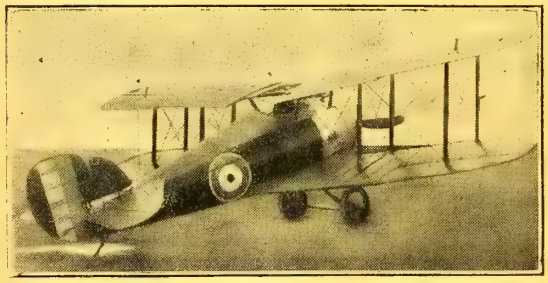

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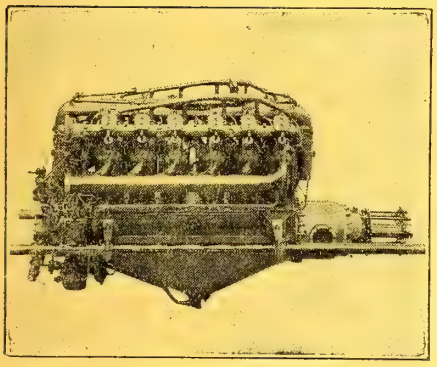

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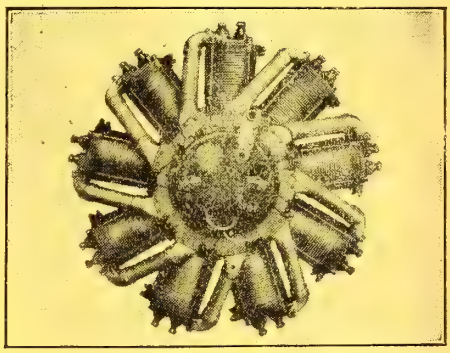
100	„	Mono
100	„	Berliet
140	„	Clerget
160	„	Beardmore
200	„	Sunbeam
300	„	Dragon Fly
400	„	Liberty
450	„	NapierLion
Etc., Etc.		



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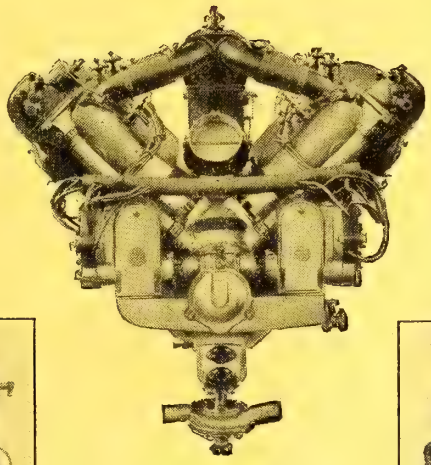

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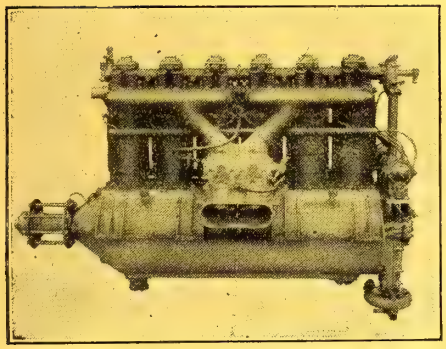

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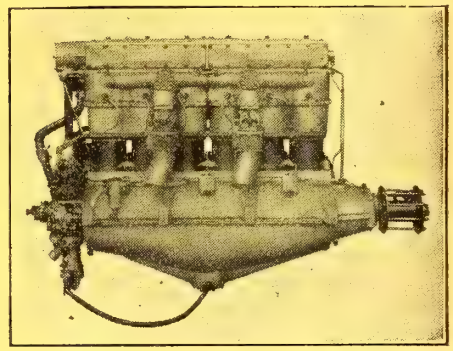

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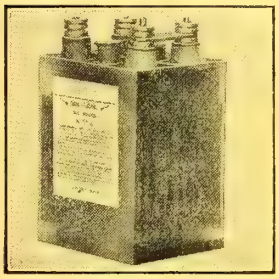

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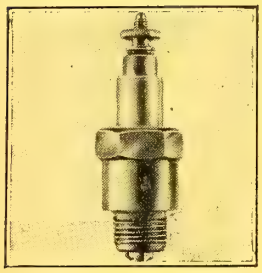

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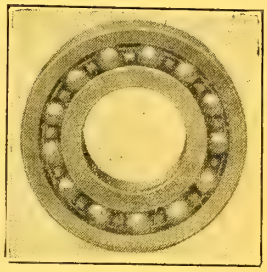

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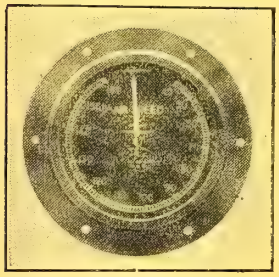

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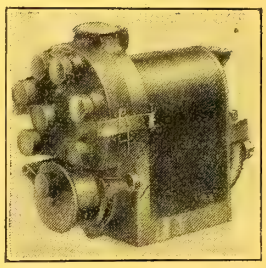

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THE AVRO COMMERCIAL TRIPLANE.—The example in the photograph is fitted with a Beardmore engine of 160 h.p. That at Olympia differs in that it has a Siddeley "Puma" of 230 h.p., and that the fuselage has been lengthened by some 7 inches, which has been added to the passengers' leg room. The salient features are the same in the two editions.

which are the distinguishing features of the Standard Training Machine.

The main dimensions and particulars are given in the appended specification :—

SPECIFICATION OF THE "RENAULT AVRO."

Span	36 ft.	Weight, empty	1,338 lb.
Chord	4 ft. 9¾ in.	Weight, loaded	1,943 lb.
Gap	5 ft.	Useful load	360 lb.
Length, overall	24 ft. 3 in.	Fuel capacity	13½ galls.
Height	10 ft. 5 in.	Endurance	2¾ hr.
Wing surface	330 sq. ft.	Speed	40-80 m.p.h.
Engine	80 h.p. Renault	Climb	5,000 ft. in 23.3 min.

THE "AVRO COMMERCIAL" TRIPLANE.

This aeroplane has been designed purely as a commercial machine and forms a very suitable means for the reliable and economical transport of passengers, mails or general merchandise by air.

It is built on the distinctive Avro lines and many of the part, such as the wings, empennage, chassis and tail skid are interchangeable with those on the standard training machine. This permits of very low production costs and facilitates the maintenance of the machine as all parts subject to wear or damage can be replaced from stock.

The passengers' cabin is situated between the middle and lower planes and is fitted to seat four passengers, after the style of a first-class railway compartment. A large door in the side gives easy access, and large Triplex glass windows provide an excellent view of the panorama below. The seats may be instantly detached and stowed away in a locker, leaving a clear space of 113 cubic feet for cargo.

Special attention has been paid to heating, lighting, and ventilation, thus making the machine ideal for long passenger flights.

The engine installed is the Siddeley "Puma" of 230 h.p. which has an excellent name for reliability and economy, and with this power plant an extremely useful performance is attained.

The three sets of wings are standard Avro wings, down to the last fitting, but provided with shortened and vertical interplane struts.

The fuselage is—as far as the after part is concerned—an enlarged version of a "standard" Avro fuselage, in that identical fittings are employed.

The fore end, comprising the cabin, naturally differs in its build. A three-ply covered structure forms the enclosed cabin, which is entirely free from any cross bracing, and to the front thereof the projecting engine mounting is built.

The pilot, who is seated aft the cabin in the top of the fuselage, and right over to the port side thereof, has an excellent view all round above the fuselage, and an adequate one forward and downward on the left side. Though this would be classed as bad visibility for any war machine, it is ample for all commercial purposes, though many war-spoilt pilots are apt to disagree.

The specification following presents the salient features of this machine.

SPECIFICATION OF THE AVRO TRIPLANE.

Span	37 ft.	Weight, empty	2,080 lb.
Gap		Weight, loaded	3,286 lb.
Chord	4 ft 9¾ in.	Useful load	720 lb.
Length overall	26 ft. 10 in.	Petrol capacity	50 gails.
Height overall	14 ft. 5 in.	Endurance	3½ hr.
Surface	498 sq. ft.	Speed	45 to 100 m.p.h.
Engine	Siddeley "Puma," 240 h.p.	Climb	10,000 ft. in 19.0 min

"THE AVRO BABY."

The Avro "Baby" should prove to be one of the most popular of the exhibits at Olympia. The small size, the neatness of construction, and the long list of extremely fine performances beginning with the winning of last year's Aerial Derby Handicap, and culminating in Mr. Hinkler's amazing flight to Rome and back thereon, should secure for it the notice of those to whom aeroplanes are pure mystery. The fact that it cruises at 60 m.p.h. on a fuel consumption of 30-35 miles per gallon, that it can be arranged to seat two, and that it can be bought at a price below that of any car capable of such a speed, should shortly reduce the present dangerously congested condition of our roads.

THE AVRO "BABY" WITH THE 35-h.p. GREEN ENGINE.—This is believed to be the identical machine which is now at Olympia, though the paint-work has been altered since this photograph was taken.

Of the details of this—one of the first of the practicable small sporting type aeroplanes—there is little to be said. It is built on Standard Avro lines. The fuselage is of spruce with steel fittings and wire in all its main structure, except in the cases of the centre section and undercarriage struts and the axle, which are of steel tube.

The structural interest lies much more in the neatness of the arrangement and the skill shown in disposing various components into the very small space available than in any startling novelty, and description here cannot much aid inspection.

In general form the machine may be likened to a very large model of a well-designed single-seat fighter of the normal tractor type, with equal top and bottom wings, a fair stagger and but one row of interplane struts per side.

The engine, very neatly encowled behind the very narrow radiator, looks—despite its really small size—rather on the large side for so small a machine, and the line of the cowl above it is followed through by that of the gradually decreasing fairing which shelters the pilot.

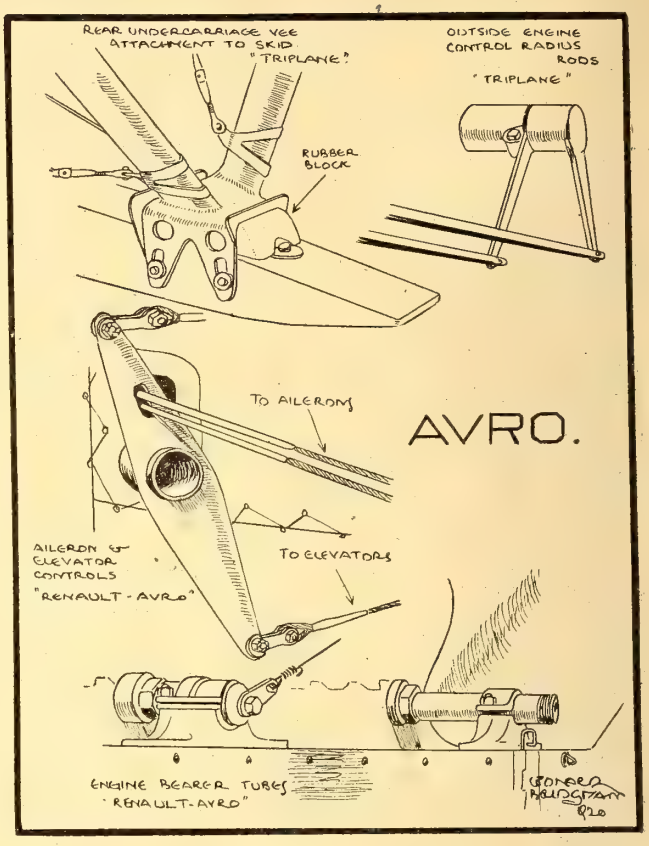
The tail is extremely like that of the Standard 504 type in form—the characteristic "circle with a bite out of it" rudder shape stamps the machine at once as an "Avro."

For the rest workmanship throughout is excellent, and the finish worthy of the model work which it so nearly approaches.

The dimensions and performances of the Avro "Baby" are appended.

Specification of the Avro "Baby."

Span	25 ft.	Weight, empty	616 lb.
Chord	4 ft.	Weight, loaded	870 lb.
Gap	4 ft.	Petrol capacity	10 galls.
Length overall	16 ft. 3 in.	Endurance	4½ hr.
Height overall	7 ft. 6 in.	Speed	35 to 80 m.p.h.
Surface	176.5 sq. ft.	Climb	5,000 ft. in 15 min.
Engine	35 h.p. Green		



SHORT BROTHERS, LTD., Rochester.

On the Short stand the object of main interest is undoubtedly the all-metal Short "Swallow." British machines of metal or mainly metal structure have been seen before, but this represents the first example of a machine which is all metal even to the covering of the wings and body. Also, most British efforts at metal construction of heavier than air craft have used steel almost entirely.

Little use has hitherto been made of light aluminium alloys in the construction of heavier than air craft. Ignorance of their properties has tended to give them a bad reputation for stability, and designers have been slow to use them on account of their alleged unreliability. On the other hand lighter than air craft manufacturers have been using these alloys for many years, and their experience shows that if properly used these alloys are as reliable and resistant as steel.

Short Bros.' wide experience in the construction of rigid airships made them familiar with aluminium alloys, and when it became apparent that something more durable than wood and fabric was required in modern aircraft, they started experimenting on duralumin with a view to building with it complete machines as light and as strong as, and definitely more durable than, the present type.

The results have been extremely satisfactory and show that for equal weight a higher factor of safety can be obtained with duralumin than with a wooden structure.

The advantage of using non-inflammable material is apparent, and the known deficiencies of wood and fabric aeroplanes, such as distortion and deterioration due to climatic conditions, are obviated.

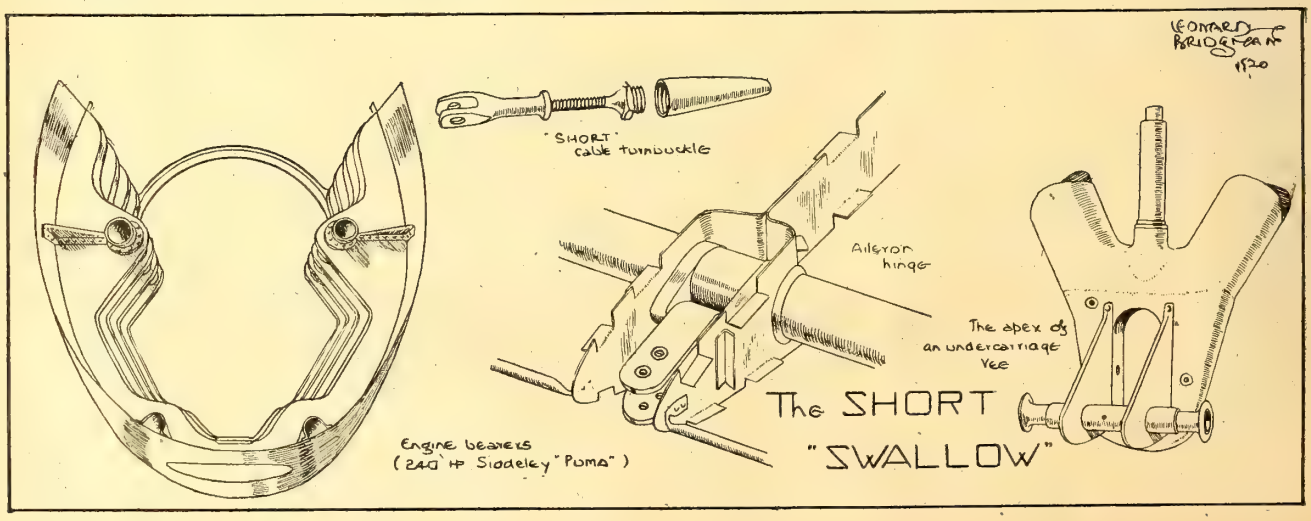
The construction generally lends itself to rapid production. Practically speaking, all the parts which comprise the making of a complete machine can be stamped out of sheet material.

The machine shown is completely built with duralumin with the exception of the wing spars, which are of steel tubing, and a few other minor parts in which it is found that steel is a more suitable material.

No wood or fabric has been used in the machine, and great care has been taken to avoid all possible risk of fire. A fireproof bulkhead is fitted aft the engine.

The machine is a single-seater single-engined tractor biplane, with "two-bay" wings, having been designed to carry mails or light freight to the amount of 400 lb. If desired, this space could be designed to take two passengers in place of mails.

The fuselage is a metal shell, similar in construction to the wooden monocoque type, and is virtually a streamline duralumin tube suitably stiffened with bulkheads, rings and longitudinals. Where holes are cut in this shell the edge is stiffened by a roll of sheet duralumin. This structure has been thoroughly tested and has proved of sufficient strength to withstand the necessary tail loads.



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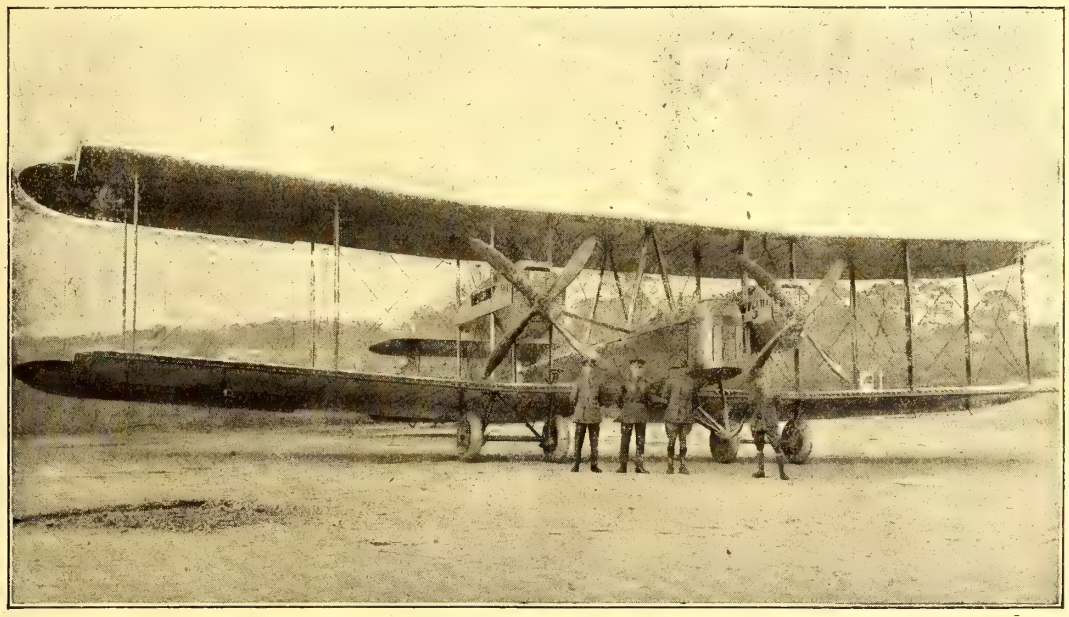

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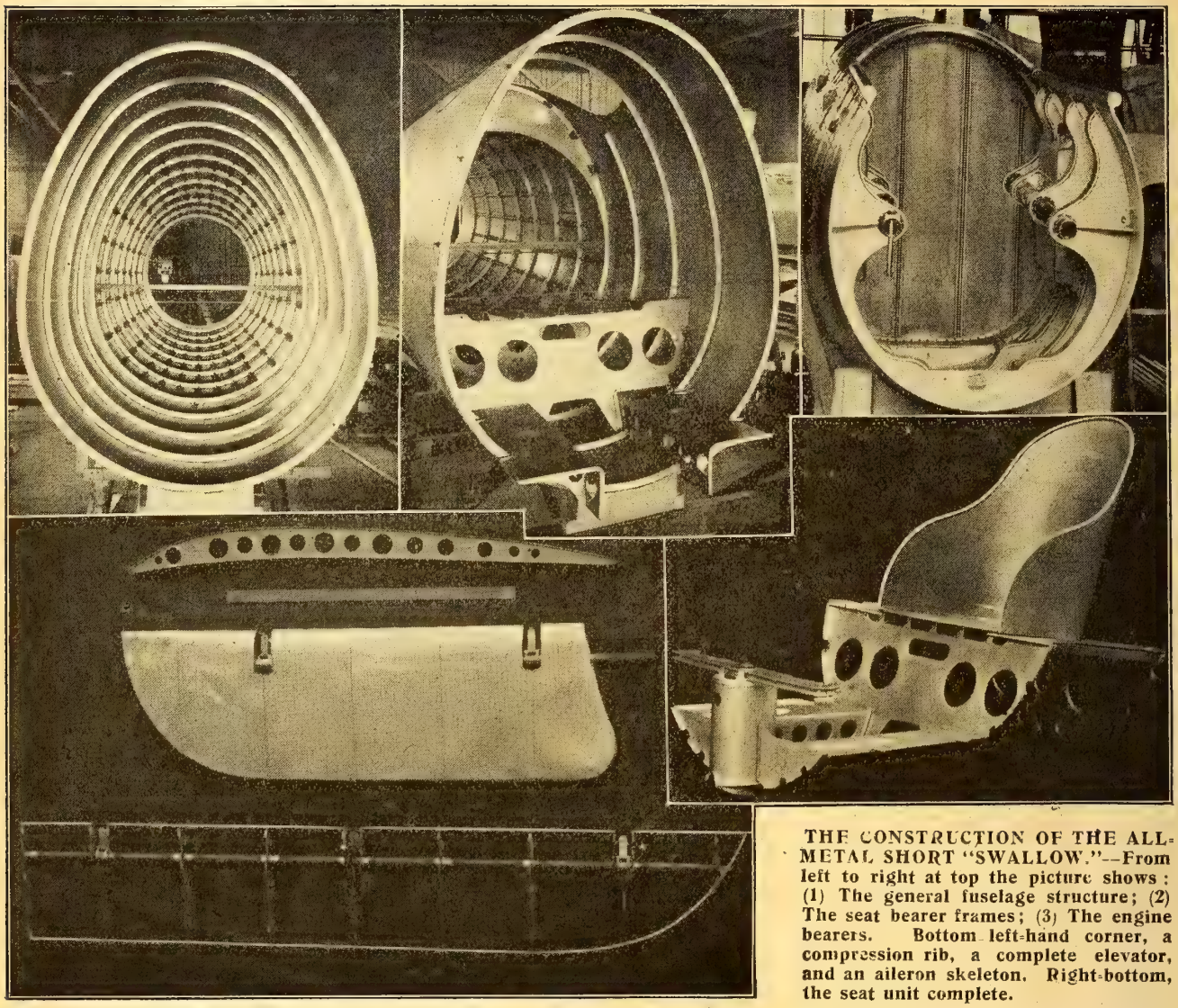
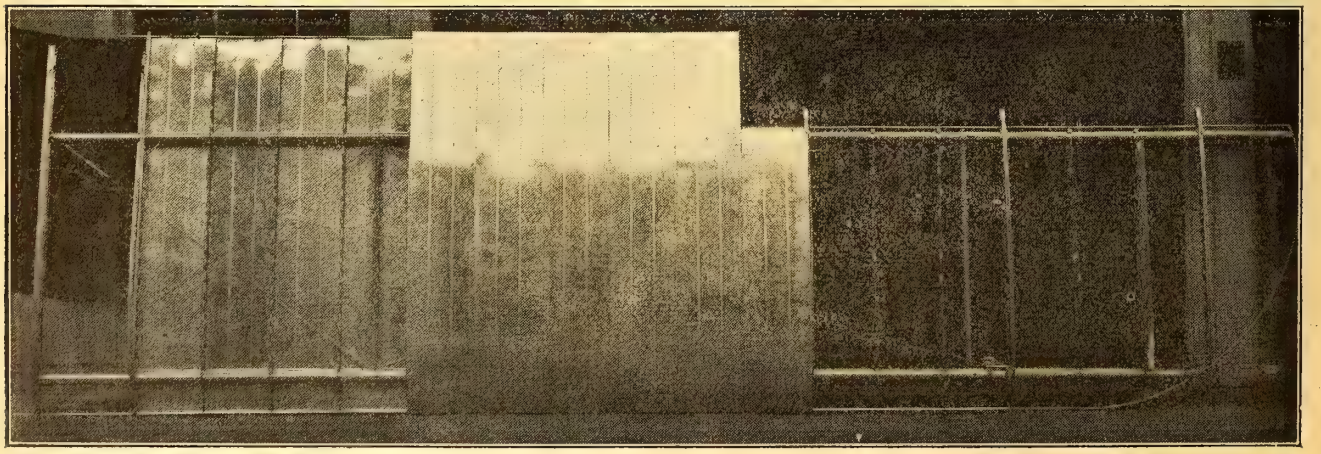


THE CONSTRUCTION OF THE ALL-METAL SHORT "SWALLOW."—From left to right at top the picture shows: (1) The general fuselage structure; (2) The seat bearer frames; (3) The engine bearers. Bottom left-hand corner, a compression rib, a complete elevator, and an aileron skeleton. Right-bottom, the seat unit complete.

The detailed design of the machine presents many points of interest. As already mentioned, the fuselage is in some respects rather similar to the wooden type of monocoque construction. It is built up of duralumin sheets of a reasonable thickness, riveted to oval channel-section formers of a somewhat heavier gauge of the same material. On the inside of the tube thus formed corrugated longitudinal stiffeners of sheet duralumin are riveted to the skin at intervals around the circumference. At the fore end, the oval formers are replaced by four very stoutly built box-section brackets, open at the top and supporting the two steel tube bearers whereon the engine rests. Immediately aft of this engine space a solid duralumin bulkhead closes off the engine from the rest of the fuselage.

Immediately under the bulkhead the steel tube front spar root is carried, and a second bulkhead farther aft serves to take and distribute the loads from the rear spar roots.

These two spar roots carry at their outboard ends a box rib of the same section as the wing proper. On the underside the lower half of the wing profile is carried right across the body, but on the upper surface is faired into the body lines in smooth curves.



A partially covered wing of the all-metal Short machine.

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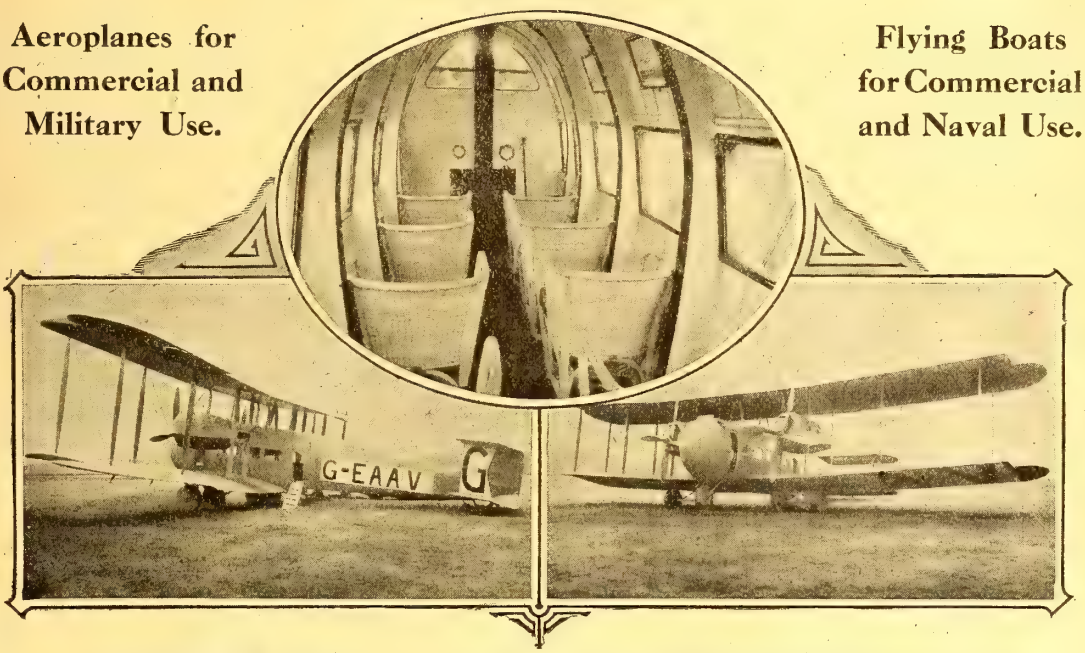

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The upper wing cabane of steel tubes springs from brackets on the upper part of the same two bulkheads as support the lower wing spar. This cabane is merely a pair of inverted "Vees," and carries the elementary centre section—consisting of one duralumin box rib and a pair of stub spar sockets.

Aft of the second of these two bulkheads is the pilot's cockpit. The furnishings of this provide an excellent example of the care expended in the design. Two half bulkheads sloping from the vertical, are riveted to the skin, with their upper edges united by a series of inverted trough section strips. These strips support the aluminium seat, with at each side a duralumin footboard. From the front of the first seat-carrying bulkhead a pair of metal angle beams run forward, forming on their upper faces a slide for the pilot's heel. At their fore end these two angles are coupled by a third much smaller partial diaphragm, whose central portion forms the rudder post support.

At the rear end of the fuselage bulkheads to support the front and rear spans of the tail plane and the rudder post are built in, and behind all an ogival tailpiece finishes off the lines of the body.

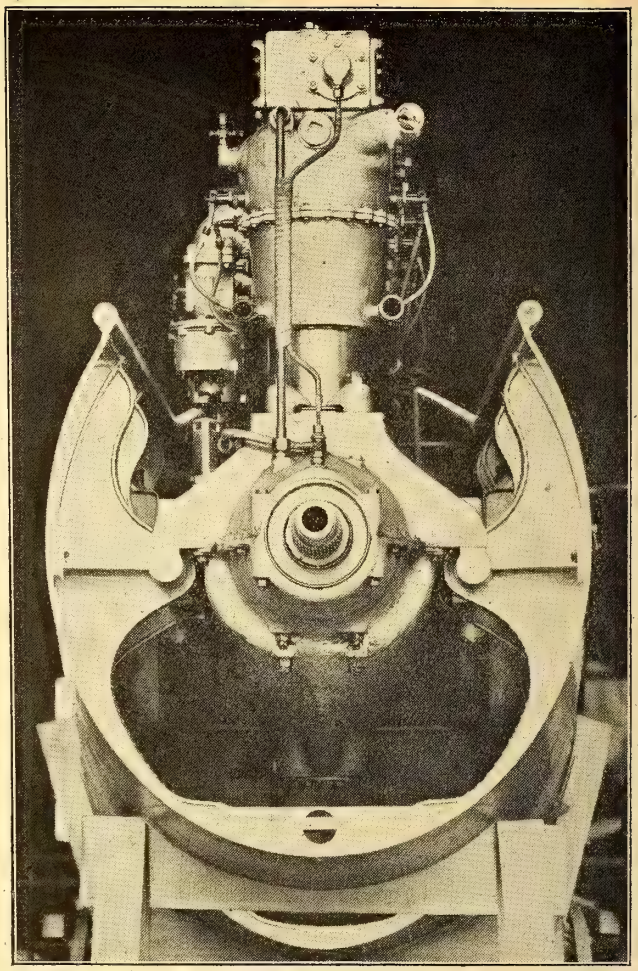
The wings are built on circular steel tubes of 50 ton steel. Circular steel tubes are admittedly not the lightest possible form of steel spar; they are, as spars, probably heavier than wooden ones of equivalent strength, but in the first place the steel tube is readily obtainable, and in the second place the circular form reduces all spar fittings to turned steel work of the simplest nature, and a good deal of weight can be saved on these fittings, so that altogether there is little lost.

In this case for the interplane strut fittings a steel sleeve is slipped onto the spar and sweated in place. Sleeve and spar are drilled, and a steel tube bush is inserted into the hole. One eyebolt and a wiring plate complete the fitting. The drift struts within the wings are attached in a similar manner, the bracing between being of stranded cable

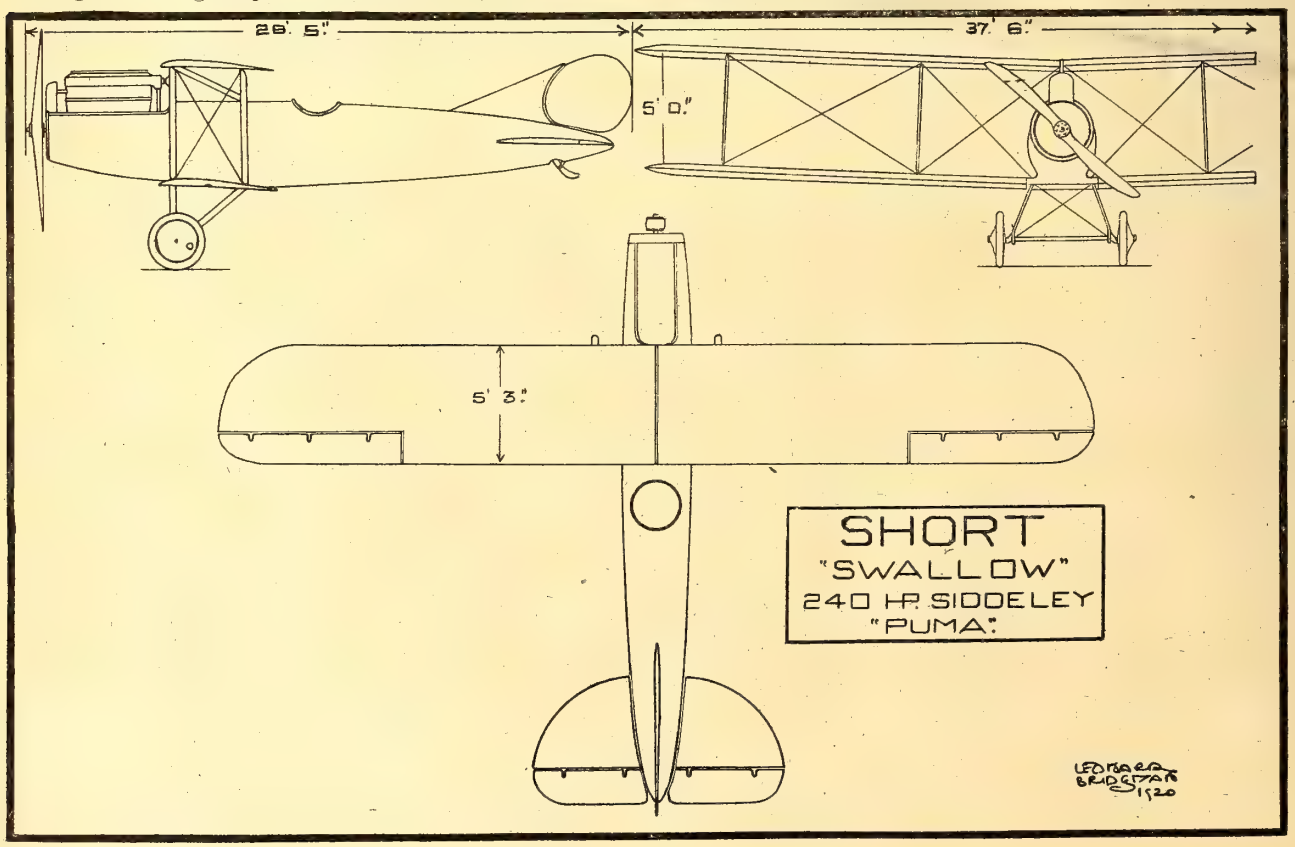
Duralumin ribs, lightened with circular holes, slip onto the spars and are secured by small pins passing through flanges in the spar hole of the rib and the spar tube itself.

These ribs have no flanges—as have ribs for fabric-covered wings—instead they are deeper throughout the chord than is the wing profile proper, and the covering sheets of duralumin are flanged upwards at their edges. The turned-up edges of the covering strips butt against the projecting rib edges. The covering strips are of such width that one intervenes between each rib, and each rib has small tongues cut and turned down on alternate sides for the cover to rest on. Thus at each rib there is a ridge, consisting of the projecting portion of the rib with the flange of one cover sheet on each side. These are then capped by a trough section strip and the five thicknesses are riveted through from outside the wing.

Damaged covering strips can therefore be removed and replaced with no disturbance to any other part of the wings and special riveting tools are unnecessary.



The Siddeley "Puma" engine in position in the fuselage of the All-Metal Short.



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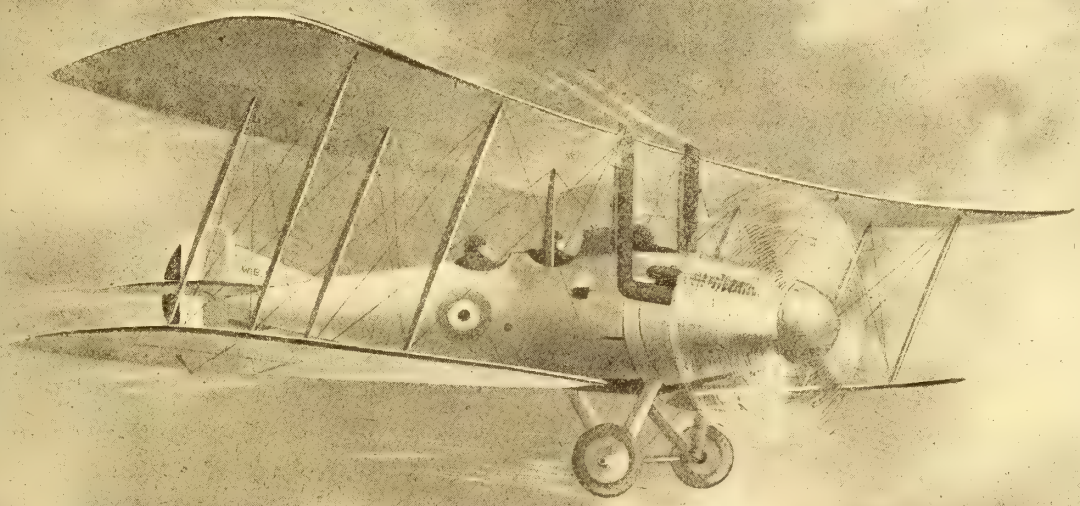

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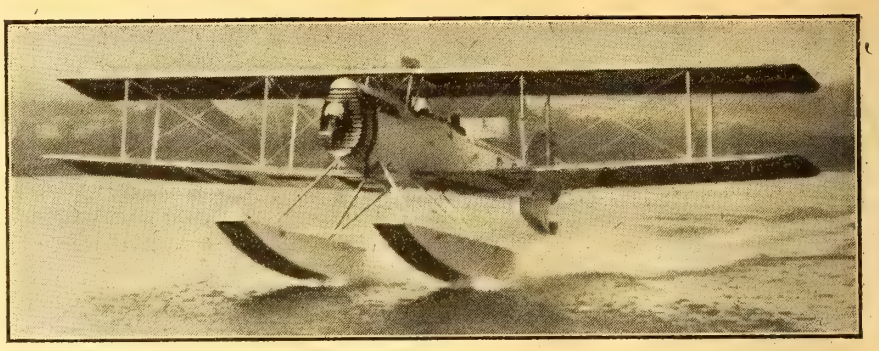


The Short "Shrimp" (160-h.p. Beardmore) about to leave the water. The very small wash produced by the special hollow-bottomed floats is very obvious, also the clean and simple outline of the whole machine.

Over that portion of the wing which carries ailerons the ribs terminate on a small diameter duralumin tube, somewhat aft the spar proper. Projecting past this tube are a number of stout duralumin box ribs, and the ailerons are hinged to these ribs, the hinge itself being carried back into recesses cut in the ailerons, which are thus balanced by the part projecting forward of the hinge.

The elevators are similarly hinged and balanced. The tail plane is built very similarly to the main wings, on tube spars with duralumin ribs duralumin covered. The tail plane spars are sufficiently strong to do without the usual bracing; there is, however, a bracing from the lower side of the fuselage to very close in on the tail spars. This is really a method of widening the base to which the spars are attached, as the fuselage is here quite narrow.

The undercarriage is of the steel tube Vee type attached to the lower wing spar roots, fitted with an undivided axle which is sprung on rubber in the usual way. In addition, there is built into the base of each Vee an oil dashpot with a plunger attached to the axle, which forms an anti-bouncing snubber.

The whole of the exposed wiring is carried out in twin stranded cable, the ends thereof fitted with the "Short" cable terminal, which serves the purpose of both strainer and cable end, and presents a much lower head resistance than the usual splice and turnbuckle. This device consists of a steel socket conical internally. Through this the cable end is passed and the ends of the strand turned back on themselves. The cable end is tinned, and solder is run into the socket.

The greater the load on the cable, the tighter the cable end is pressed into the cone, and the resulting joint is considerably stronger than any splice. The rear end of the coned socket is closed by a screwed-in fitting with a female thread which takes an ordinary fork end similar to those of the standard type of turnbuckle. One end of each cable is fitted with a right-hand, and the other end with a left-hand, thread to the fork end, and the cable may thus be adjusted by turning it at both ends.

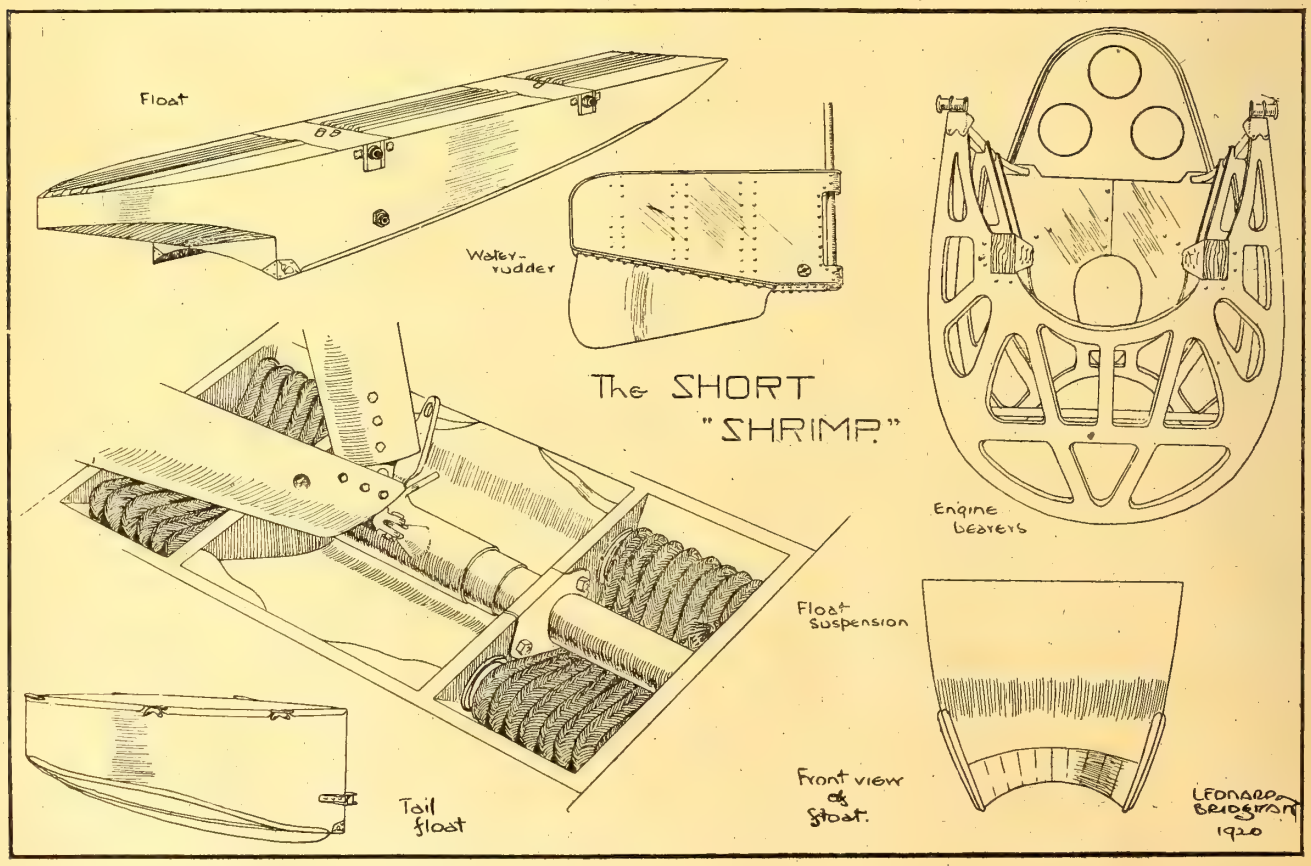
Specification of the Short "Swallow."

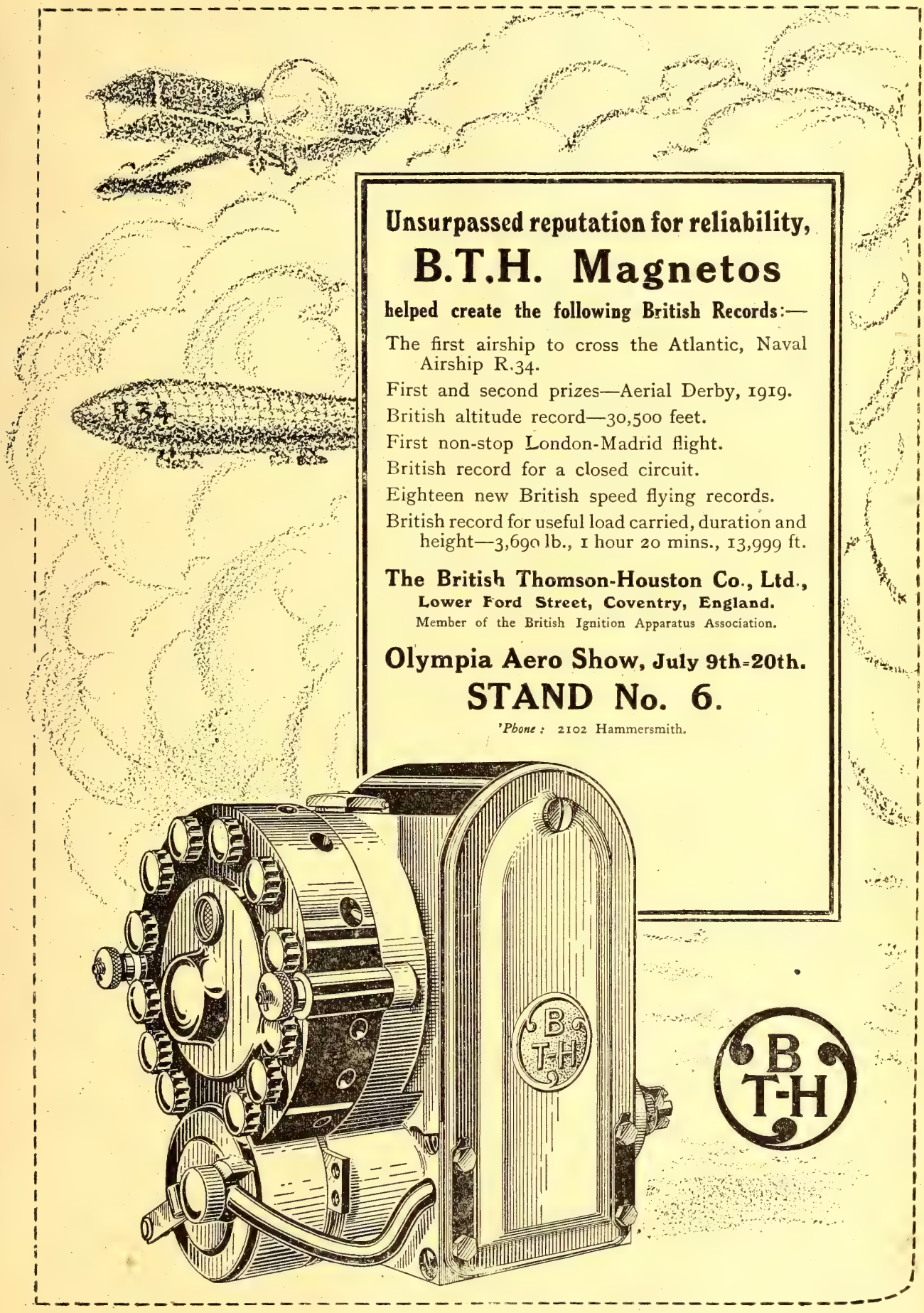
Engine	Siddeley "Puma"	Useful load	400 lb.
B.H.P.	260	Lb. per h.p.	11
Surface	370 sq. ft.	Lb. per sq. ft.	7.86
Span	37 ft. 6 in.	Speed—	
Chord	5 ft. 3 in.	Maximum	120 m.p.h.
Gap	5 ft.	Cruising	90 m.p.h.
Length overall	26 ft. 5 in.	Range—	
Height	10 ft. 6 in.	At full power	360 miles
Petrol Tank capacity	50 gal.	At cruising speed	450 miles
Oil Tank capacity	6 gal.	Endurance—	
Total weight	2870 lb.	Full power	3 hr.
Weight empty	1865 lb.	Cruising speed	5 hr.
Fuel and oil	425 lb.	Climb	10,000ft. in 11 min.
Crew	180 lb.		

The Short "Shrimp" Sporting Seaplane.

The Short "Sporting Type" seaplane, if less of a novelty, should nevertheless not be allowed to escape attention. Seaplanes have unfortunately suffered too much neglect of recent years, and the development of commercial aviation has thereby suffered seriously.

The present machine, built by a firm with an unparalleled experience in the designing and building of seaplanes of the twin-float type, has been specifically designed for the needs of the present day.





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In the standard form the machine is a four-seater, with two seats in tandem forward under the centre section—these fitted with dual control—and twin seats side by side aft the wings. Obviously the seating space may be arranged for goods, and any load up to the equivalent of pilot and 540 lb. may be carried. The standard engine is the 160 h.p. Beardmore, but the Siddeley "Puma," of 230 h.p., may be installed with no alteration, for cases where a higher performance is needed.

In form the machine follows the war-time type of Short seaplane—that is to say it is a single-engine tractor biplane fitted with twin floats.

In construction the machine is simple and robust.

The fuselage is of three-quarter oval section, built on wooden longerons. The sides are covered with three-ply, supported on shaped spruce and three-ply formers, the top and bottom are separated by steel tube struts, cable braced. The bottom is flat, the top is domed by a facing of spruce laths. Forward of the rear seats steel tube bracings are used largely, these serving to adequately stiffen the body where the openings for the cockpits would otherwise reduce the strength appreciably.

The engine is installed on bearers carried from built-up and lightened multi-ply formers, which, with the longerons and the plywood skin, form the whole fuselage structure at the fore end. The general similarity of the method employed for this part in the all-metal Short, despite the change in material, is very obvious when the two are compared.

As with the metal machine the wing spars are of steel tube, and the wing spar fittings are very similar in the two cases. Built-up spruce ribs of lattice girder form are used in this case, with steel tube drift struts and cable bracing. As with all Short seaplanes these wings are fitted with the Short patent folding gear, hinges for this purpose forming the junction of top and bottom rear spars to the centre section rear spar and the wing root rear spar respectively. The front spars are each fitted with a stout spigot which enters the terminal socket on the centre section or root spar, and is locked there by retaining pins passing through both spigot and socket.

The undercarriage is of established Short form. It consists of one pair of steel tube Vees—similar generally to the normal Vees of a land undercarriage—which spring from the spar root tubes of the lower wing. Across this pair of Vees is rigidly attached a cross member—also of steel tube. Well ahead of these Vees and springing from beneath the second set of engine bearer brackets one single forwardly-raking tube on each side supports a second cross member parallel to the aft one.

Both cross members overhang their tube supports and pass through slotted guides which are built into the side walls of the floats. These slots are capped with steel bridge pieces which serve to prevent the floats from falling off the cross members. Rubber shock absorber cords are wound around two steel tube bobbins built into the float and pass beneath the undercarriage cross axles, and the weight of the machine is transmitted through the rubber cord to the fabric of the float itself. The floats themselves act as struts between the two cross members, and cross bracing in both fore and aft and transverse planes adds rigidity to the structure.

The floats themselves are of some interest. They are similar in many ways to the old type Short float, in that they are three-ply covered pontoons built on four longerons, but they differ from the older and better known type in two obvious ways. The first is that aft the step they are fitted with a tapered tail, instead of being cut off, and the second is that they are fitted with hollow planing bottoms.

Those who have any experience of seaplane work will remember the extreme difficulty of building any form of float bottom which will stand the effects of a heavy alighting. Efforts to strengthen float bottoms of the flat type usually resulted merely in the addition of an enormous weight, with very little decrease in the number of punctured floats. Rigidity of the bottom is necessary to a certain extent, and rigidity calls for a certain appreciable depth in the member whereof it is required.

A sheet of thin metal, or three-ply, flat, has no appreciable rigidity, but curled up to a semi-circular or trough section, the sheet acquires at once a very respectable degree of this quality. This is the principle of the new Short float bottom, the hollow form whereof gives to the skin itself a very considerable degree of stiffness, and thus obviates the need for a large number of stiffening timbers.

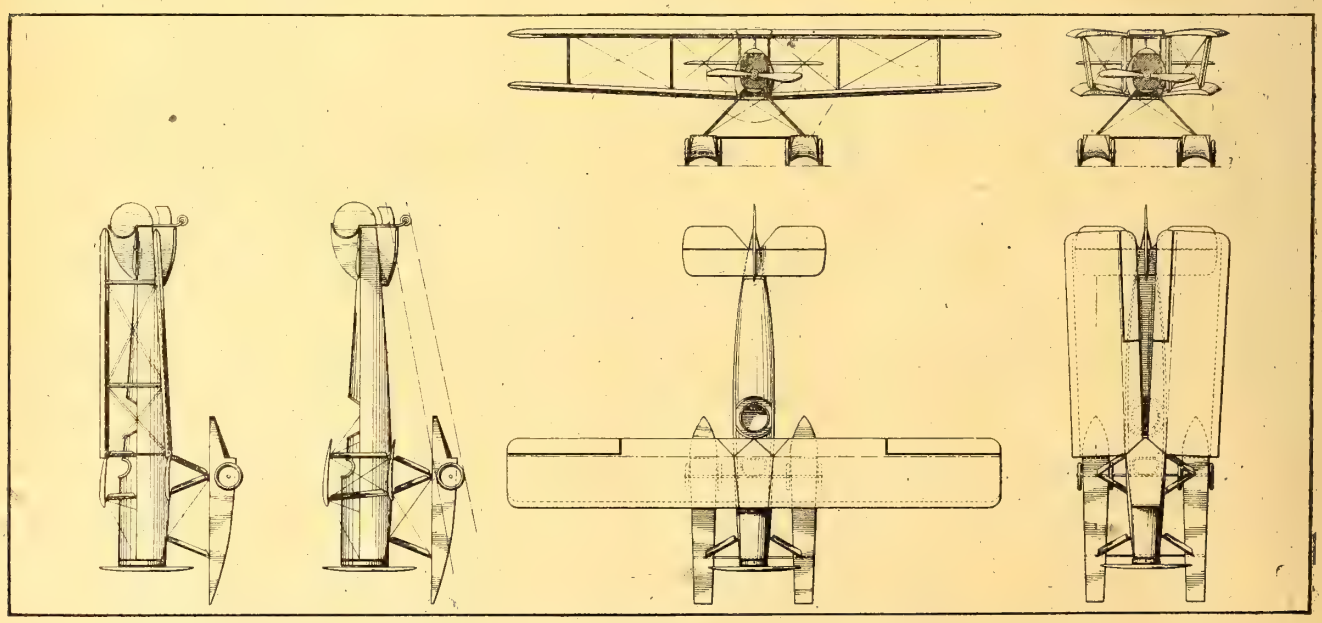
Further, such rigidity is inherent in the skin itself, and is more or less uniform, whereas any method of stiffening by internal longitudinals or cross members results in a number of lines of abnormal stiffness with an intervening relatively flexible area—consequently a very complex distribution of stress and a liability to local failure.

Thus the Short hollow bottom is both lighter and stronger than is the older type of flat bottom. The more usual Vee or rounded bottom secures somewhat similar advantages, but has the disadvantage that spray is thrown outwards by floats of such form. The Short float is, on the contrary, remarkably free from spray thrown sideways, and this has a marked effect on the life of airscrews on Short seaplanes.

One very important feature of this float is that if it be necessary to beach the machine the float bottom proper is clear of the beach, and the whole weight comes upon the side frames directly. Punctured bottoms from pebbles and the like therefore need not be feared. The float edges which bear on beach or slipway are metal shod, and damage to them is practically impossible. The aft end of the fuselage is provided with a tail float attached directly to its underside, and following the tail float is a water rudder. This latter is a novelty. The ordinary form of water rudder is apt to be a delusion and a snare, in that as soon as the machine is under way the tail float and the rudder leave the water. To carry the rudder down below the float is merely to invite damage when the machine is on the beach.

Here the rudder is a compound affair. The main portion is a duralumin box, which carries on the line of the tail float bottom and leaves the water with the float. But there is hinged to it an extension which, in the water or the air extends some way below the float, but which on the beach folds upwards to within the box part.

The main floats are fitted with through-going steel tubes just under and parallel to the aft undercarriage cross axle,



Outline drawings, to scale, of the Short Sporting type sea plane in both open and folded positions.

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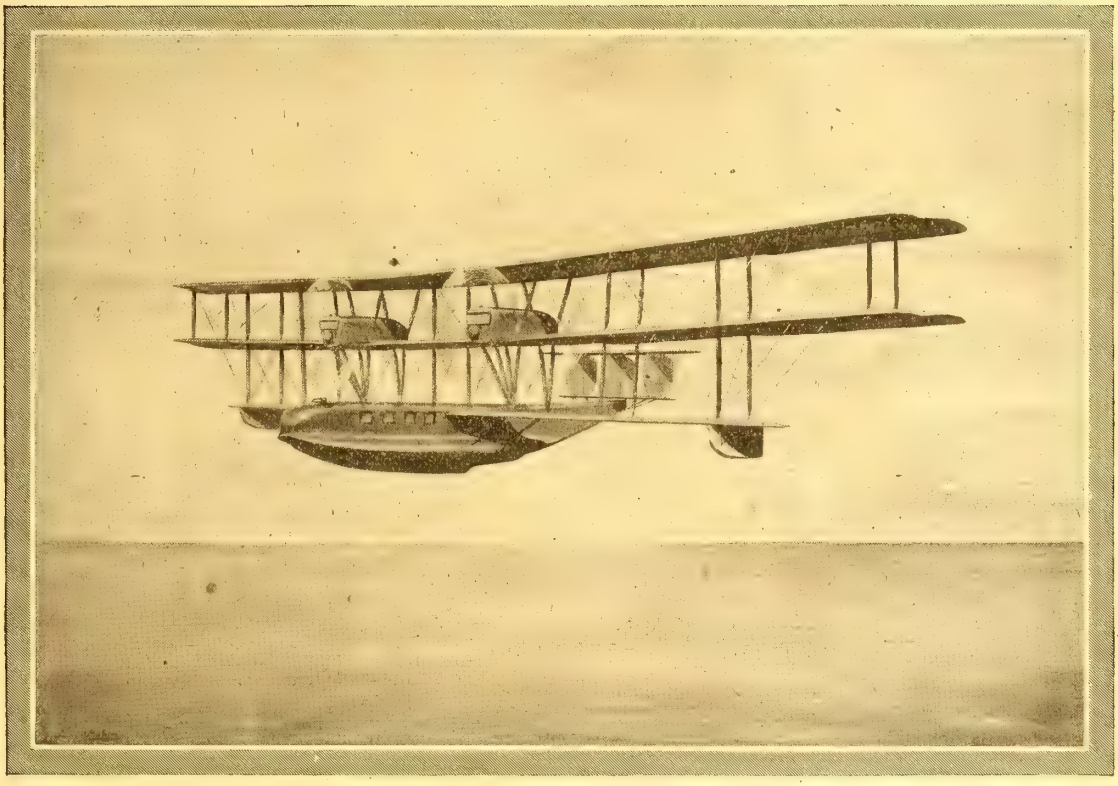

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into which an axle carrying at each end an ordinary landing wheel may be inserted.

Also the tail float is provided with a socket, whereinto may be inserted the steering head tube of a sort of miniature bicycle front fork and wheel. With these wheels in place the machine may be man-handled about on shore even more easily than the majority of land machines.

The many advantages which overwater flying possesses as compared with overland work seem to have been largely overlooked by those who have discussed the possibilities of commercial aviation in the immediate future. The description of this machine—one of the few seaplanes at Olympia—may serve as a reminder that seaplanes exist, that every seaport, and not a few other busy cities possess alighting surfaces suitable for seaplanes in the very centre of their business quarters, that in flight over water in a seaplane the question of the whereabouts of the nearest possible landing ground does not exist, that over water the fastest competing form of transport is capable of no more than 30 m.p.h., and that at 60 knots aerial transport is a very economical method of travel. Did one believe that the business men of to-day possessed any wisdom one would be content to add *Verb. Sap.*

Specification of the Short "Sporting Type" Seaplane.

Engine	160 h.p. Beardmore
Maximum power	200 h.p.
Fuel—	
Petrol (3 hr. flight)	35 gal.
Oil	3 gal.
Dimensions—	
Span	44 ft.
Span folded	15 ft.
Length	33 ft.
Height	12 ft.
Total surface	500 sq. ft.
Loading—	
per sq. ft.	6.2 lb.
per h.p.	15.5 lb.
Passengers and Crew—	
Pilot	1
Passengers	3
Range	270 miles
Weights—	
Total weight	3,100 lb.
Weight empty	2,095 lb.
Petrol	255 lb.
Oil	30 lb.
Water	80 lb.
Pilot	160 lb.
Passengers and freight	480 lb.
Performance—	
Speed	83 m.p.h.
Climb	10,000 ft. in 35 min.

THE SOPWITH AVIATION AND ENGINEERING CO., LTD., Kingston-on-Thames.

The main exhibit of this famous firm consists of three machines, the Dove, the Gnu, and the Antelope.

The Dove.

Of these the Dove is the smallest and will awaken fond memories on the part of all those ex-pilots who have spent happy hours in air on the "Pup." For in general appearance the Dove closely resembles this delightful single-seater.

The fuselage, built of ash longerons and spruce struts with steel wire bracing, is of practically identical form with that of the older machine. Starting from the cowl of the 80 Le Rhone engine it tapers in plan to a vertical knife-edge stern post, with sides nearly straight till the last 15 inches or so. In side elevation the top rail is straight, though surmounted by a domed fairing, the lower longeron curving first downwards to give depth to the cockpits and then upwards to the tailpost. Instead of the single cockpit of the Pup, there are here two—the pilot's in its original position—since even Sopwiths can place him no farther forward, and the passengers immediately aft.

This additional load aft the C.G. calls for the only other visible change from the original, a sweep back of the wings of some 5 degrees, to reaccommodate the relations of the centres of lift and of gravity.

Apart from this, the wings appear to be as of old, staggered, with one row of interplane struts per side, and the characteristically splayed out centre section struts. All interplane wiring is of the streamline type, fitted with the simple trunnion joint which originated from the Sopwith works. Ailerons are fitted to all planes.

The aft end of the fuselage carries the tail, which conserves—as have most Sopwith tails—the approximately rectangular shape with slightly rounded corners, the ear-shaped rudder, and the fin which originates forward in a semicircular lobe, overhanging the tail plane leading edge.

In this machine the refinement of an adjustable tail has been fitted, and flight either with or without passenger occurs without change to the equilibrium of the machine.

Beneath the tail the very effective Sopwith tail skid, shod with a knife-edged shoe, is attached.

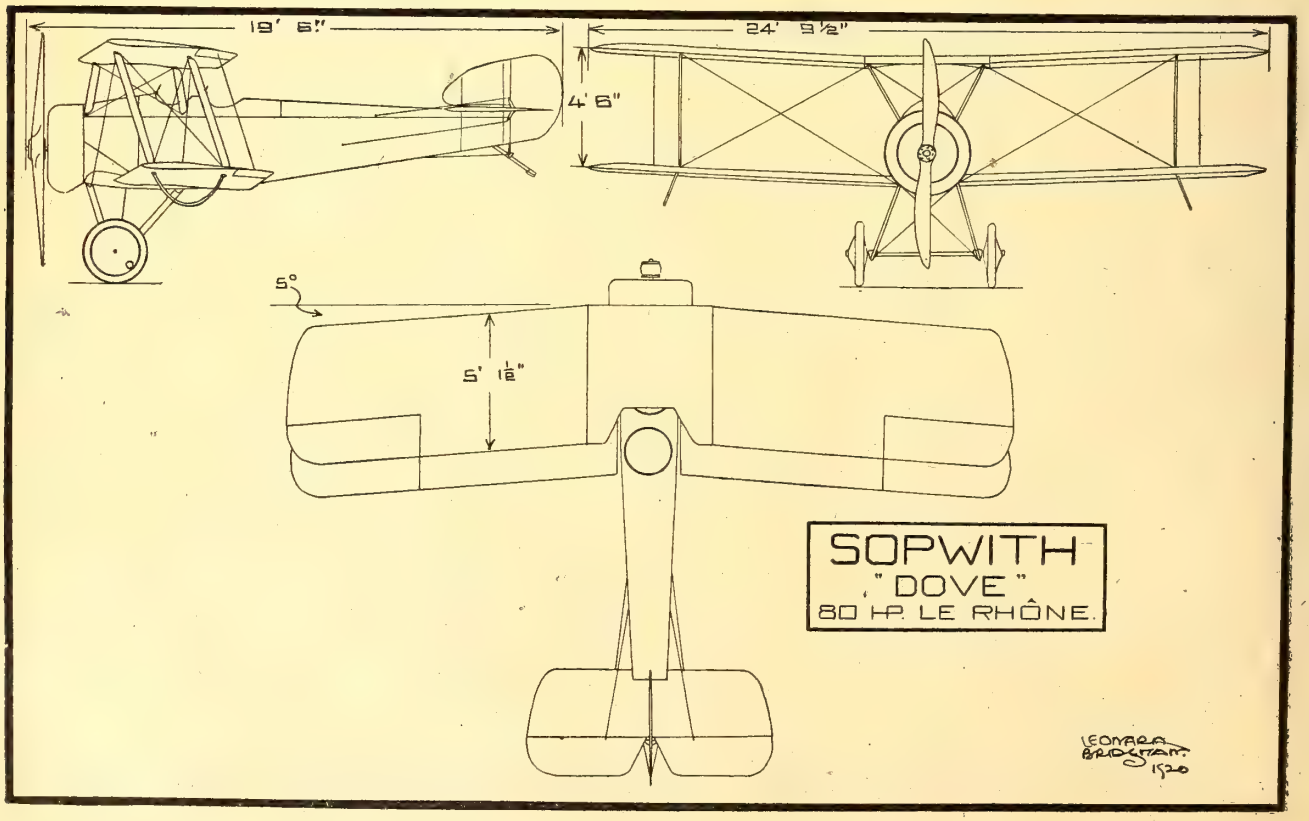
Fuel and oil tanks—all of the gravity feed type—are installed within the fairing ahead of the pilot's seat, and the petrol system is thus reduced to its simplest terms.

The standard Vee type of undercarriage, shod with standard Palmer wheels, complete the machine, which should form one of the most perfect two-seater sporting aeroplanes which the heart of a pilot could desire.

The specification hereafter supplies those details of size and performance which the verbal appreciation has neglected.

Specification of the Sopwith "Dove."

Span	24 ft. 9½ in.	Weight loaded	1,430 lb.
Chord	5 ft. 1½ in.	Useful load	180 lb.
Gap	4 ft. 6 in.	Petrol capacity	
Surface	220 sq. ft.	Endurance	2½ hr.
Engine	80 h.p. Le Rhone	Speed	35-95 m.p.h.
Weight, empty	765 lb.	Climb	5,000 ft. in 7½ min.



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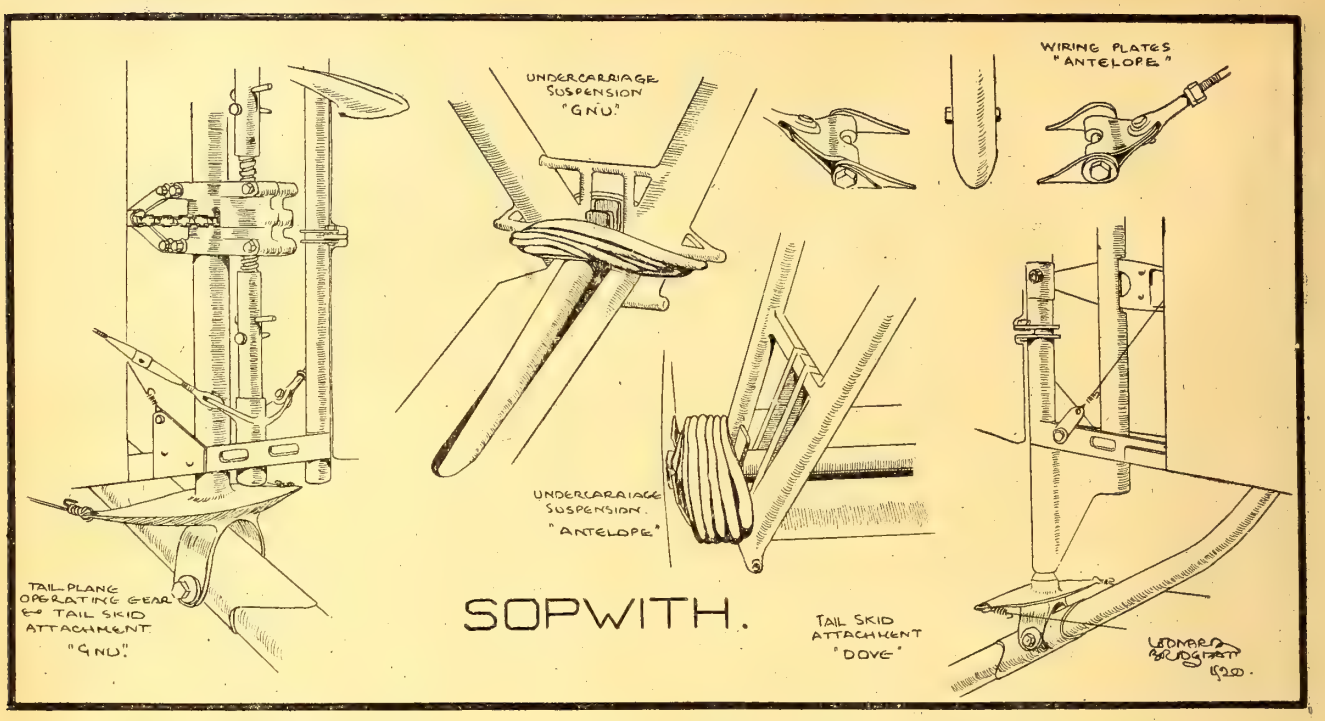


The Sopwith "Gnu."

The Sopwith "Gnu" is a considerably larger machine—as unmistakably a Sopwith as is the "Dove"—which should appeal to those who recognise the "points" of an aeroplane, and who desire to travel by air in comfort, relative silence, and the absence of wind, quite as strongly as will the "Dove" to those who rather prefer to experience even the minor discomforts of flying rather than forgo any of its sensations.

This again is a rotary engined machine, capable of receiving either the 110 h.p. Le Rhone—or for cases where a large surplus power is desired, the 230 h.p. Bentley.

In form and construction the fuselage is similar to that of the "Dove," though naturally larger. The pilot's cockpit again follows immediately behind the engine and below the centre section. Aft of this follows the passenger accommodation, with seats for two side by side in a totally enclosed cockpit of the glazed roof type. Entrance to this compartment is through this roof, which can be opened for the purpose.

The tail again is similar, though larger than that of the "Dove," with the exception that the rudder is balanced.

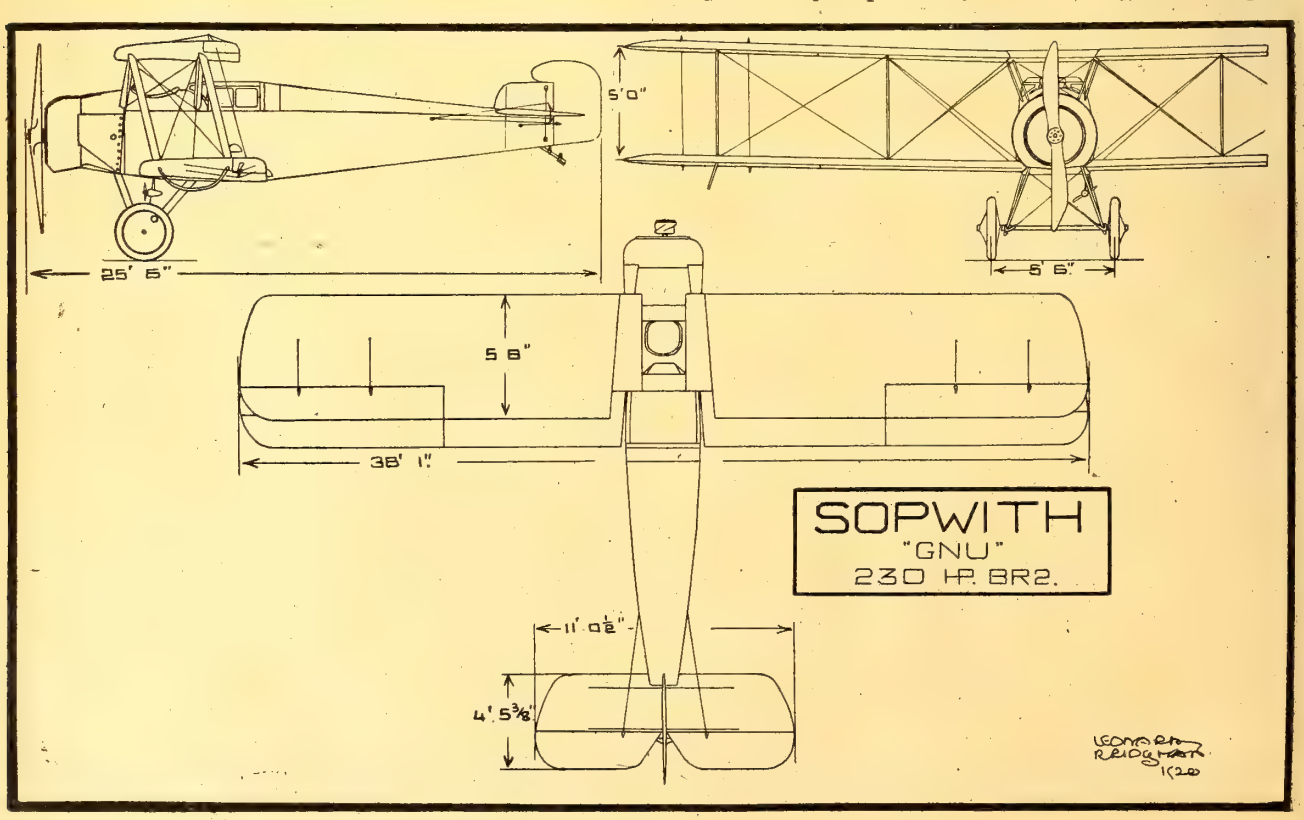
The wings are of equal span and chord, less staggered than in the "Dove," and devoid of any sweepback, and, in view of the increased span, are of the two bay a side type.

Spruce interplane struts of streamline section and streamline interplane wiring complete the wing structure, all fittings being of the steel sheet type and of Sopwith Standard design.

The machine actually exhibited is fitted with the 200 h.p. Bentley engine.

Specification of the Sopwith "Gnu."

Span	38 ft. 1 in.	Weight, empty	1,315 lb.
Chord	5 ft. 6 in.	Weight, loaded	2,160 lb.
Gap	5 ft.	Useful load	360 lb.
Length overall	25 ft. 6 in.	Petrol capacity	60 gall.
Height	10 ft.	Endurance	$3\frac{1}{4}$ hr.
Surface	350 sq. ft.	Speed	40 to 100 m.p.h.
Engine	230 h.p. Bentley	Climb	5,000 ft. in $6\frac{1}{2}$ min.



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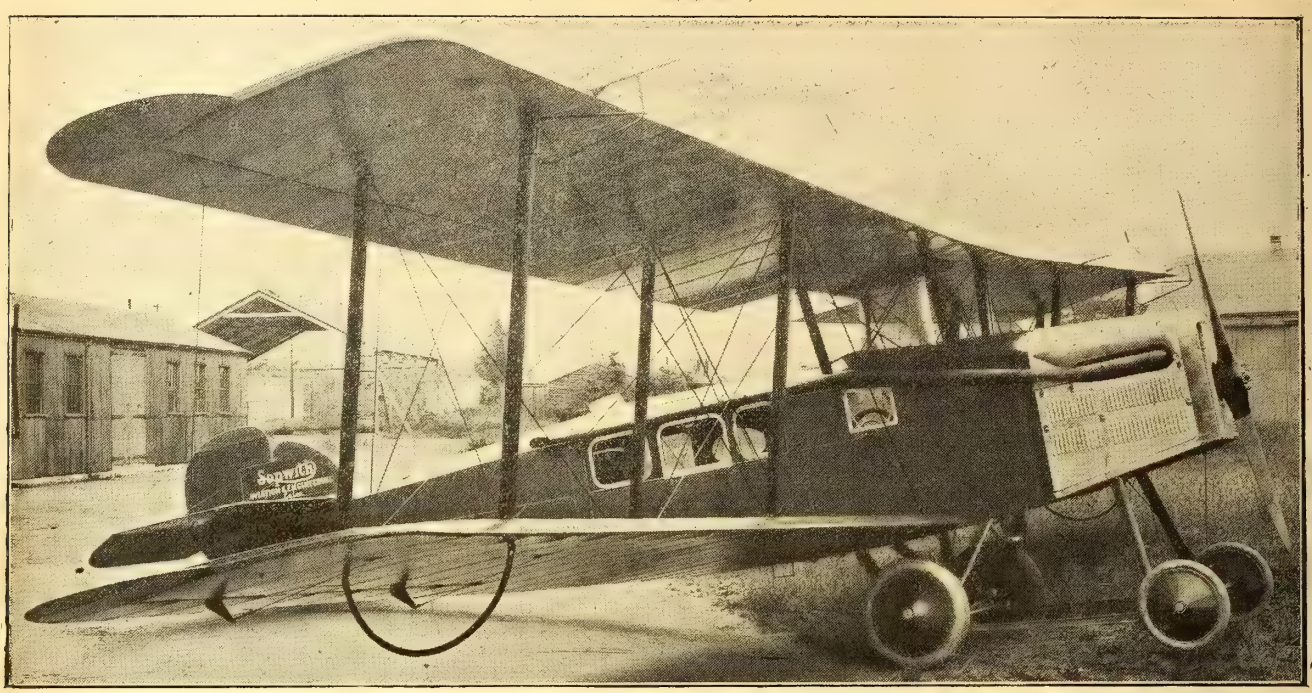


THE SOPWITH "ANTELOPE."—A limousine passenger craft with the 180-h.p. Wolseley "Viper" engine.

The Sopwith "Antelope."

Though the "Antelope" differs in certain respects from any previous Sopwith, it neverthless conserves the characteristic Sopwith appearance.

It differs from the "Gnu" in that it has a stationary water-cooled engine, that it is considerably larger in dimensions, and greater in weight, and that its passenger cabin is of the full-fledged side entrance limousine type. This latter is provided with ample Triplex windows. One of the seats is arranged so that the passenger may sit in a raised position and, on opening a sliding door in the deck, may fly with his head in the free air.

The passengers are seated *vis-à-vis* in very spacious wicker chairs, and it is the rear one who may enjoy fresh air, though probably the front passenger, back to the engine, will need it more.

The cabin imposes certain changes in the lines of the fuselage, and the top rail is no longer straight, but rises from the front engine bracket to the top of the cabin, falling thereafter to the tail. Otherwise there is little change. The span and the total wing surface is appreciably greater than that of the "Gnu," and balanced ailerons are fitted to all wings, but in general and in detail design the wing structure is very similar, as, indeed, are all the components except the cabin.

The general range of usefulness is the same as that of the "Gnu"—but the accommodation is more spacious, and the fact that the engine is of the stationary water-cooled type would seem to promise lower fuel and engine maintenance costs, and would probably give a sense of greater reliability to most potential purchasers.

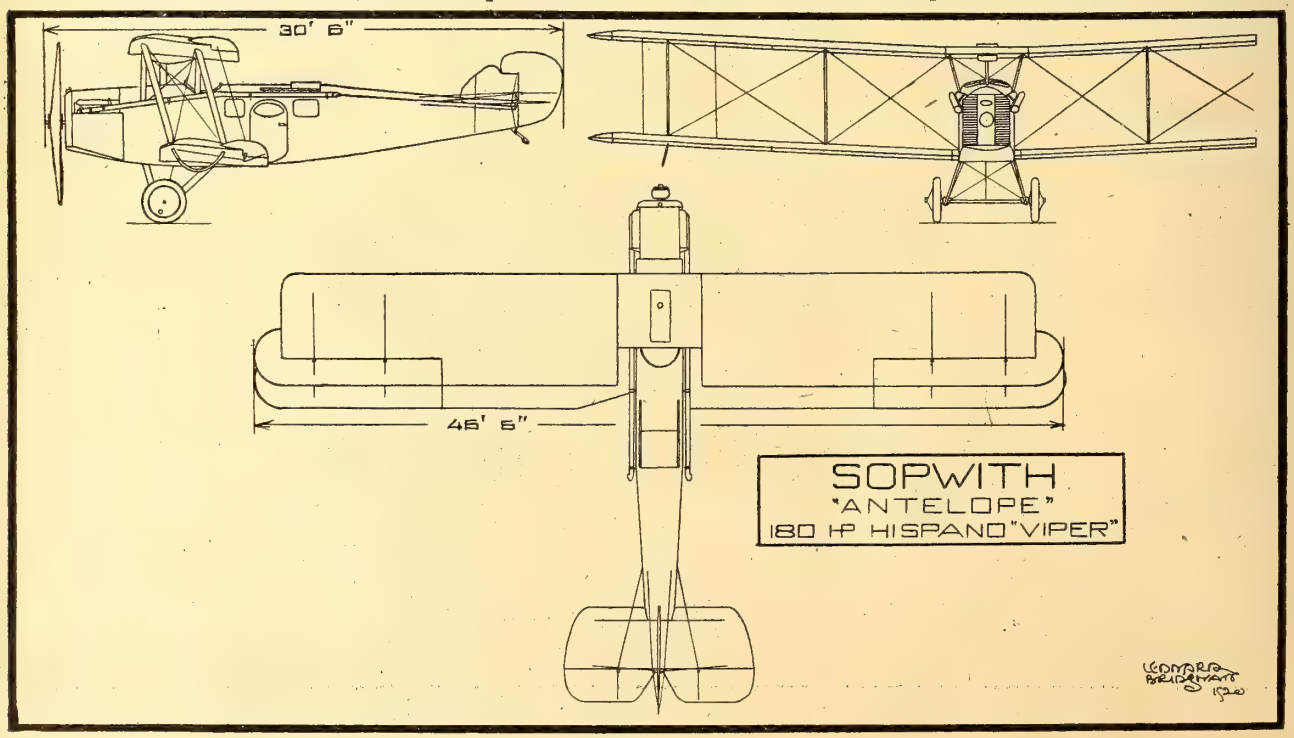
The dimensions of the "Antelope" are given hereafter.

Specification of the Sopwith "Antelope."

Span	48 ft. 6 in.	Weight, empty	2,100 lb.
Chord	6 ft. 3 in.	Weight, loaded	3,000 lb.
Gap	6 ft.	Useful load	360 lb.
Length overall	30 ft. 6 in.	Fuel capacity	65 gals.
Height overall	11 ft.	Endurance	4 hr.
Surface	550 sq. ft.	Speed	38 to 100 m.p.h.
Engine	Wolseley "Viper" 180 h.p.	Climb	5,000 ft. in 7½ min.

Surrounding the Stand there are to be found a series of excellent scale models of nearly the whole range of the Sopwith aeroplanes. These include the "Tabloid" of 1913, the Schneider Cup machine of 1914, the "Pup," "1½ Strutter," "Camel," "Cuckoo," "Dolphin," and "Snipe."

These models show excellently the process whereby Sopwiths have evolved their present machines



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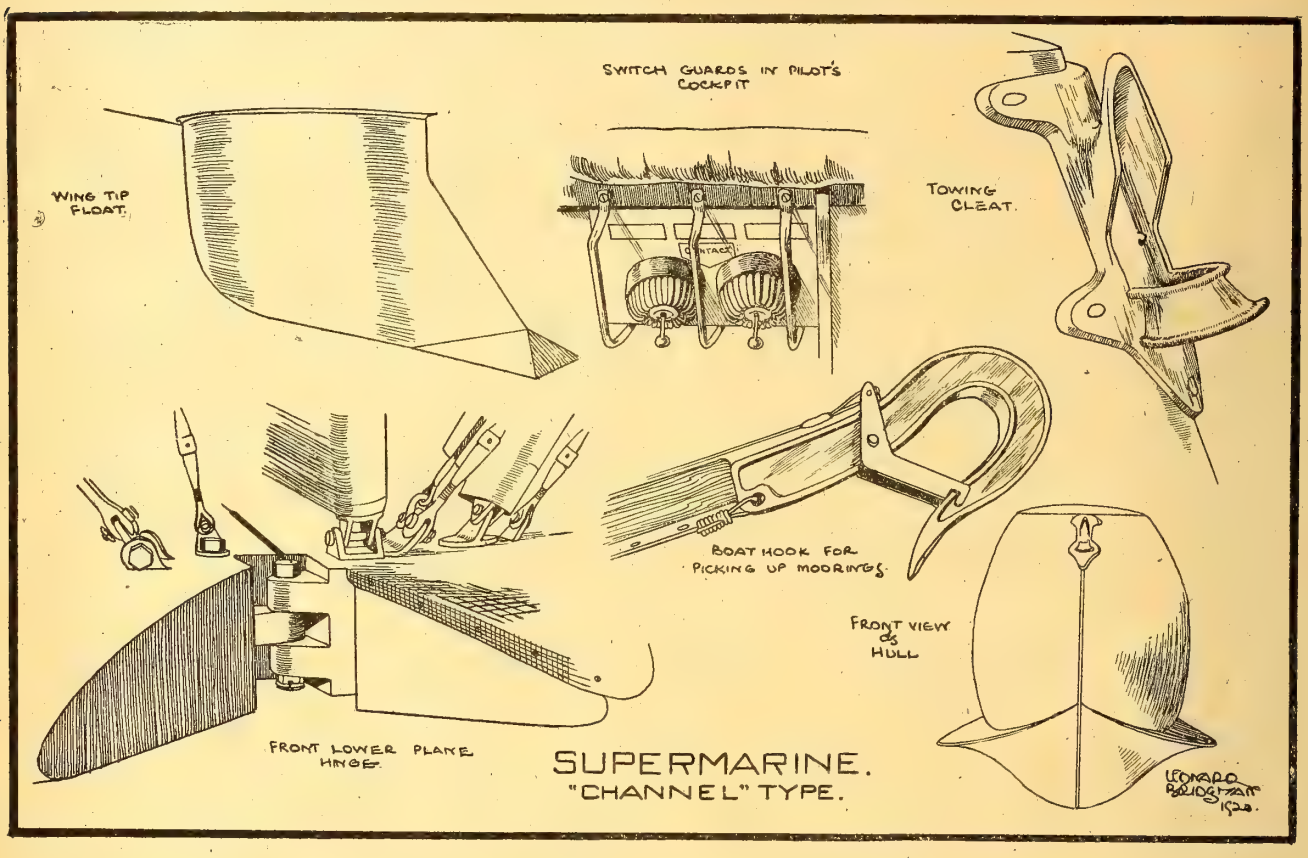

The Supermarine Company show two examples of their excellent flying boats, one designed to carry a pilot and three passengers and known as the "Channel Type" boat, and the other a small fast, single-seater known as the "Sea King." Both of them are such as to delight the heart of any sea-faring man, for they are pre-eminently the product of men who know and understand the sea and its ways.

THE "CHANNEL TYPE."

Primarily the "Channel Type" boat is designed for passenger work, and as such the comfort of the passengers has been considered in every possible way. The boat, as shown, has lids to let down over the passenger compartments for the benefit of those who like an enclosed machine, but Mr. Hubert Scott-Paine, the managing director of the firm, and his practical assistants, agree with one's personal predilection for an open cockpit with an adequate windscreen. The boat can be supplied fitted in either way.

The outstanding feature about the Supermarine boats is the hull structure. From bow to stern the boat is of oval or elliptical section built up with diagonal planking on formers. The result is an enormously stiff and yet pliable hull. Mr. Scott-Paine has a convincing habit of demonstrating these apparently contradictory facts. First of all he pushes his fist vigorously into the side of the hull at any point and demonstrates that it can be pushed in but will invariably spring back. He then proceeds to suspend his thirteen-stone gracefully from the extreme tip of the tail-plane, thus putting an enormous torsional strain on the thinnest part of the hull, a strain in fact that would never be put upon it in practice. Despite the leverage thus afforded by his weight the actual displacement of the end of the tail-plane is far less than one generally achieves with quite a slight pull on the tail-plane of any ordinary land machine.

Incidentally the tail-plane itself is a boat-built job and is not covered with fabric alone. As Mr. Scott-Paine points out, the fact that the hull is oval in form results in every blow from a wave, or even from a boat barging alongside, compressing the hull structure, whereas in a slab-sided boat the effect is to bend the structure inwards in such a way that it has a tendency to break, even if it does not do so.

The step, and the projecting chines necessary to give it sufficient planing surface, are built on separately and are divided transversely by bulk-heads so that quite apart from the hull itself, the steps provide six water-tight compartments underneath the hull. Therefore even if the hull itself is absolutely filled with water, the boat can still keep afloat.

Another interesting point about the boat is that the power-plant is entirely separate from the wing structure. The engine-bearers are carried in the top of an A-shaped structure, which also carries the radiator. The result is that none of the engine vibration is communicated direct to the wing-structure, a very consoling thought to those who think about vibration effects on wiring plates and such things.

The wings themselves call for no special comment beyond the fact that the workmanship is fully up to the Supermarine Company's standard.

The tail unit is, however, worthy of special mention. Owing to the elevated position of the engine it is necessary to have a negative tail-plane so as to keep the tail down against the airscrew thrust. For this reason the tail unit is made as a biplane. The upper plane is cambered the wrong way so that it is in fact a depressing plane. The lower plane, on which Mr. Scott-Paine does gymnastics as described, is on the other hand a lifting plane. The result is that when the screw is running, the slip-stream acting on the upper tail-plane keeps the tail down and trims the ship fore and aft. As soon as the slip-stream of the airscrew ceases, the lower plane, which is out of the slip-stream, comes into effect and lifts the tail against the depression of the upper plane, so that the boat is free from that distressing tendency to throw its nose up in the air and stall, which would otherwise be the case, and so the pilot is relieved of the necessity for pushing the boat's nose down immediately that the engine stops.

The boat is full of clever little ideas for the convenience of the pilot and passengers. For example, in the main cockpit the passengers' seats spring up as soon as they are not sat upon. The result is that when one boards the boat from a dinghy, one steps onto a grating instead of stepping onto the cushions and making them wet or muddy. Also the cushions are thus kept dry if the boat is being flown in the wet without passengers and without a cover over the cockpit.

Another interesting little gadget is the Supermarine patent boat-hook, which has an automatic catch arrangement and is itself attached to a line, so that when picking up moorings, as soon as the boat-hook grips the mooring-chain, the boat is definitely moored without the necessity for hauling in yards of wet chain and handling a wet can or float.

The arrangements for the anchor are just as handy. The anchor is stowed against the side of the boat. The line is taken forward through a special cleat arrangement in the bow and back to the side of the pilot's cockpit, where it is coiled round a special form of belaying horn—one can scarcely call it a be-

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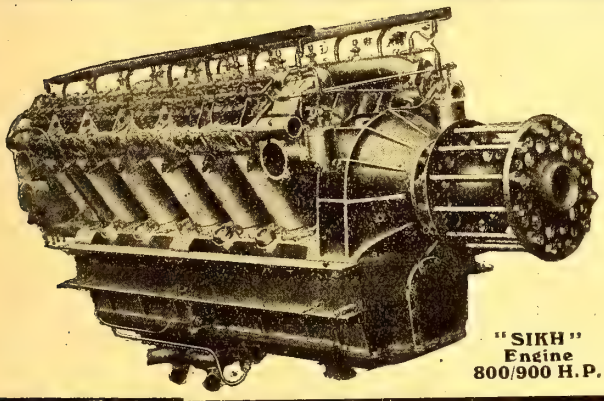
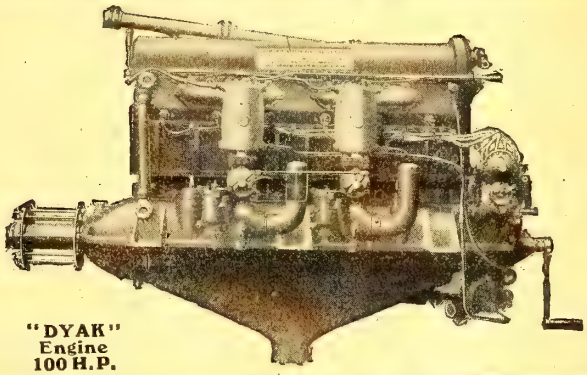


"SIKH" Engine 800/900 H.P.



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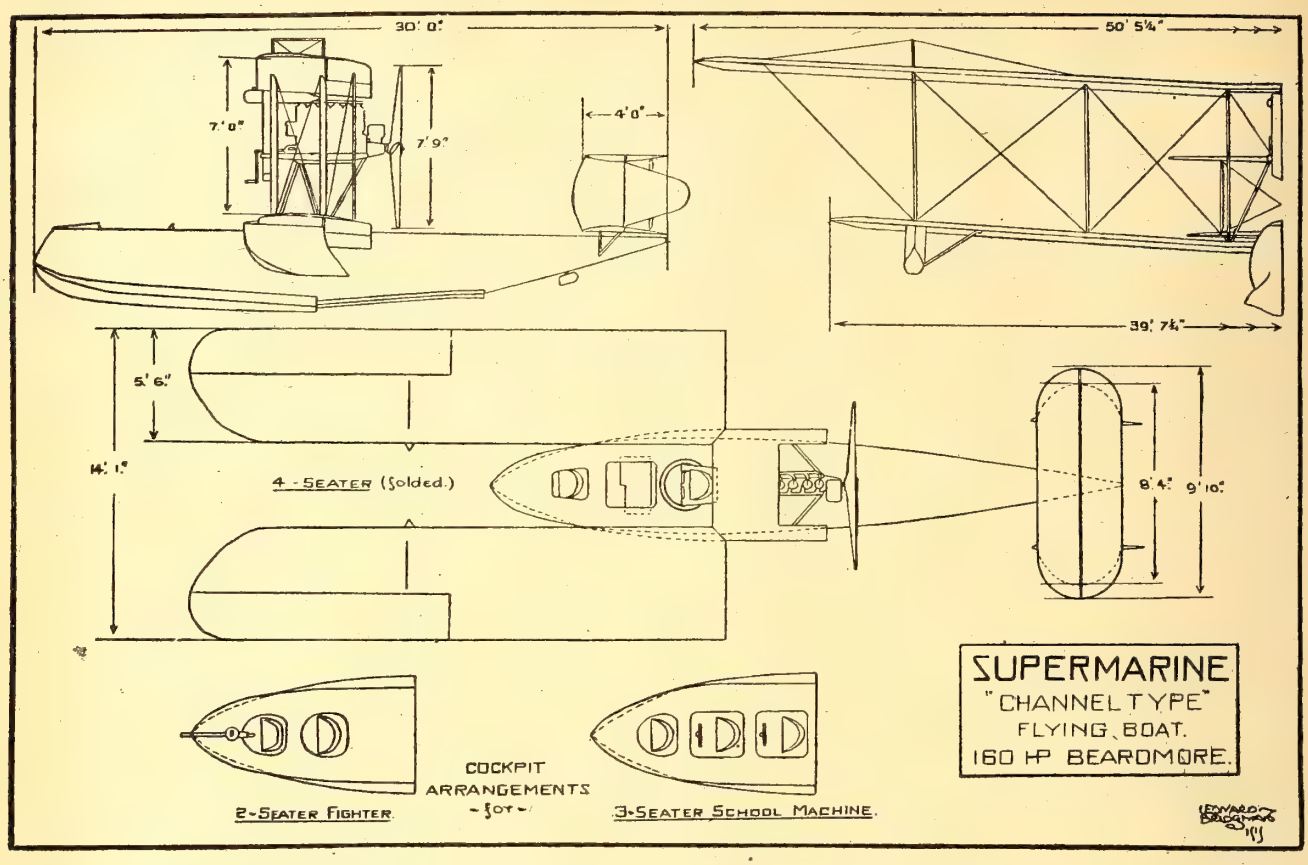
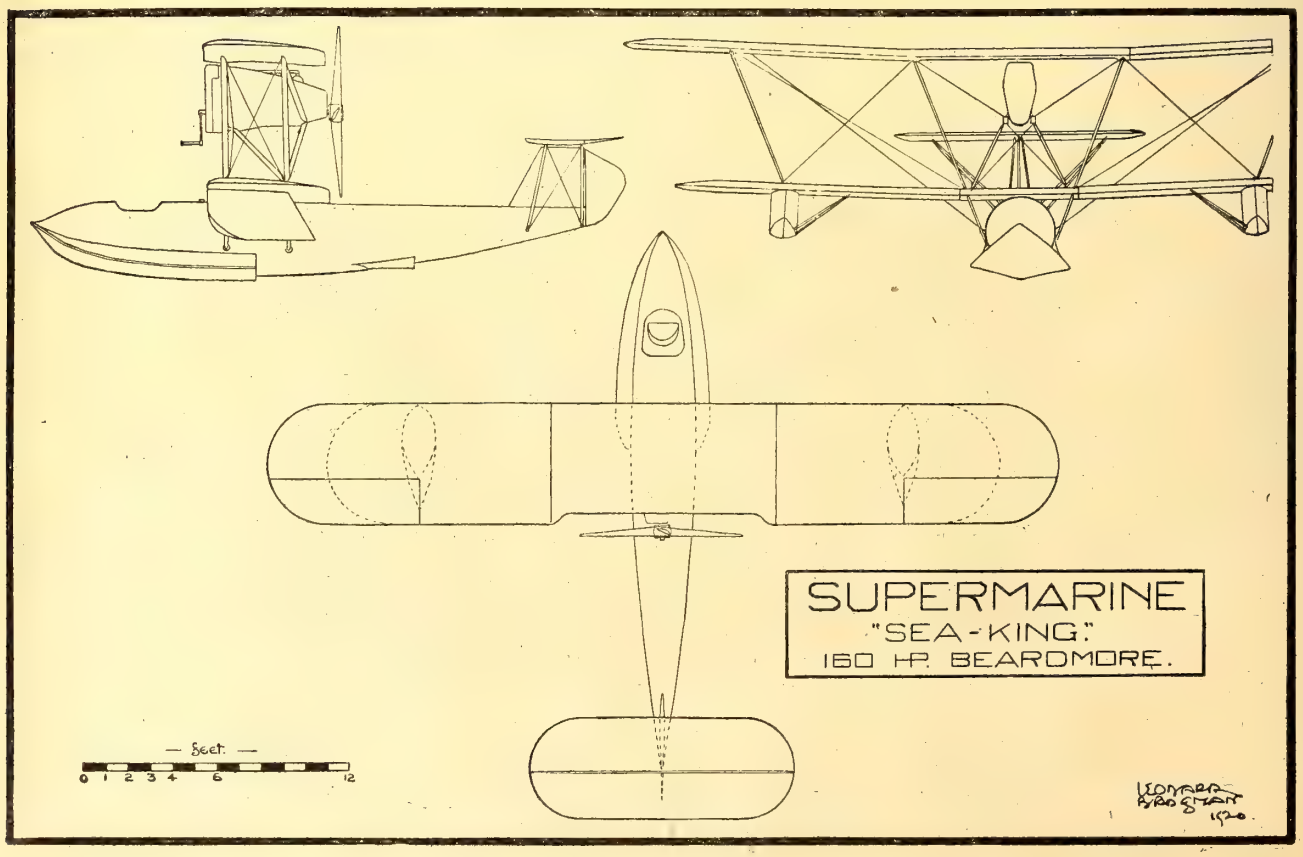


laying pin. By this arrangement the anchor can be dropped at once by the pilot and the line paid out from his seat, or, if he so desires, the anchor can be left in its clips and the line can be used as a heaving line if a tow is desired, the same line being used in either case and the strain in either case being taken by the extreme bow of the boat.

Another simple and useful idea which is not common in flying boats is that the hull itself finishes in a brass-bound tip astern and the tip has in it an eye through which a line can be passed when lowering the boat down a slipway, or when it is desired to stow her astern.

The efficiency of the "Channel Type" boat may be gauged from the fact that although her engine is only a standard 160-h.p. Beardmore, she puts up a speed of 70 knots with a pilot and three passengers, or 540 lb. of dead load, with petrol for a range of 240 to 250 sea miles.

Furthermore the firm states that "by sacrificing one passenger the machine can be fitted with an amphibian landing



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gear." Though one might resent being personally the sacrificial passenger, one would not mind being one of the two left while the third was taken, so that one might have the additional advantage of being able to alight on land.

Incidentally, Mr. Scott-Paine says that he is getting excellent results out of the 160-h.p. Beardmore, which, in the case of the particular engine in this machine, is giving a power output of 175 h.p.

SPECIFICATION OF THE SUPERMARINE "CHANNEL" BOAT.

Span	50 ft. 5½ in.	Weight (full)	3,400 lb.
Chord	5 ft. 6 in.	Weight (empty)	2,356 lb.
Gap	7 ft.	Engine	160-h.p. Beardmore
Length	30 ft.	Speed	70 knots
Height	13 ft.	Climb	3,000 ft. in 15 min.
Surface	453 sq. ft.		

THE "SEA KING."

The "Sea King" is a small fast single-seater which for general purposes follows the structural methods of the "Channel Type" boat. With its 160-h.p. Beardmore engine it puts up a speed of 96 knots, so that it is either a thoroughly sporting little vehicle for the single or unhappily married man, or is a useful small fast patrol machine for Naval work along troublesome coasts. Its chief difference in design from the "Channel Type" lies in the fact that it only has a monoplane tail of the depressing kind and so takes rather more flying on the part of the pilot than does the bigger machine.

SPECIFICATION OF THE SUPERMARINE "SEA KING" BOAT.

Span	30 ft. 5 in.	Weight (full)	2,500 lb.
Chord	5 ft. 6 in	Weight (empty)	2,250 lb.
Gap	6 ft. 2½ in.	Engine	160 h.p. Beardmore
Length	24 ft.	Speed	96 knots
Height	10 ft. 3 in.	Climb	10,000 ft. in 20 min.
Surface	284 sq. ft.		

THE SUPERMARINE CONTROL.

A point particularly worthy of mention, namely, the control unit, is common to all the Supermarine flying boats. The rudder bar and control column, either with or without wheel control, are mounted on a horizontal triangle of steel tubes with the necessary cross-bars to carry the control column. The apex of the triangle carries the pivot and the rudder bar and is anchored to the floor of the boat. The two other corners of the triangle merely rest on the floor without touching the sides of the boat, so that as the sides of the boat work under shock from the sea they in no way affect the frame on which the control is mounted. One may perhaps best describe this control frame as a sort of triangular trivet anchored at one corner.

The idea is extraordinarily neat and besides having the advantage of not interfering with the hull structure in any way, it has the additional advantage that when the control wires are disconnected the whole control unit can be lifted out of the machine in less than ten minutes. The idea is just one of those ingenious things of which everybody might have thought years ago and nobody did.

Altogether one is inclined to be very enthusiastic about the Supermarine exhibit, which will very well pay for an inspection by all visitors, but especially to those concerned with the sea. It is in fact of such a thoroughly seafaring nature as to penetrate even the intelligence of a senior officer of the Royal Navy and convince him that there is after all something in aviation, for he will find sufficient of his old sea-going practice in the details and gadgets of the boats, and especially in the smell of tar from the mooring line, to make him feel at home and make him forget that the whole thing is really so new that according to his preconceived notions he ought to ignore its existence.

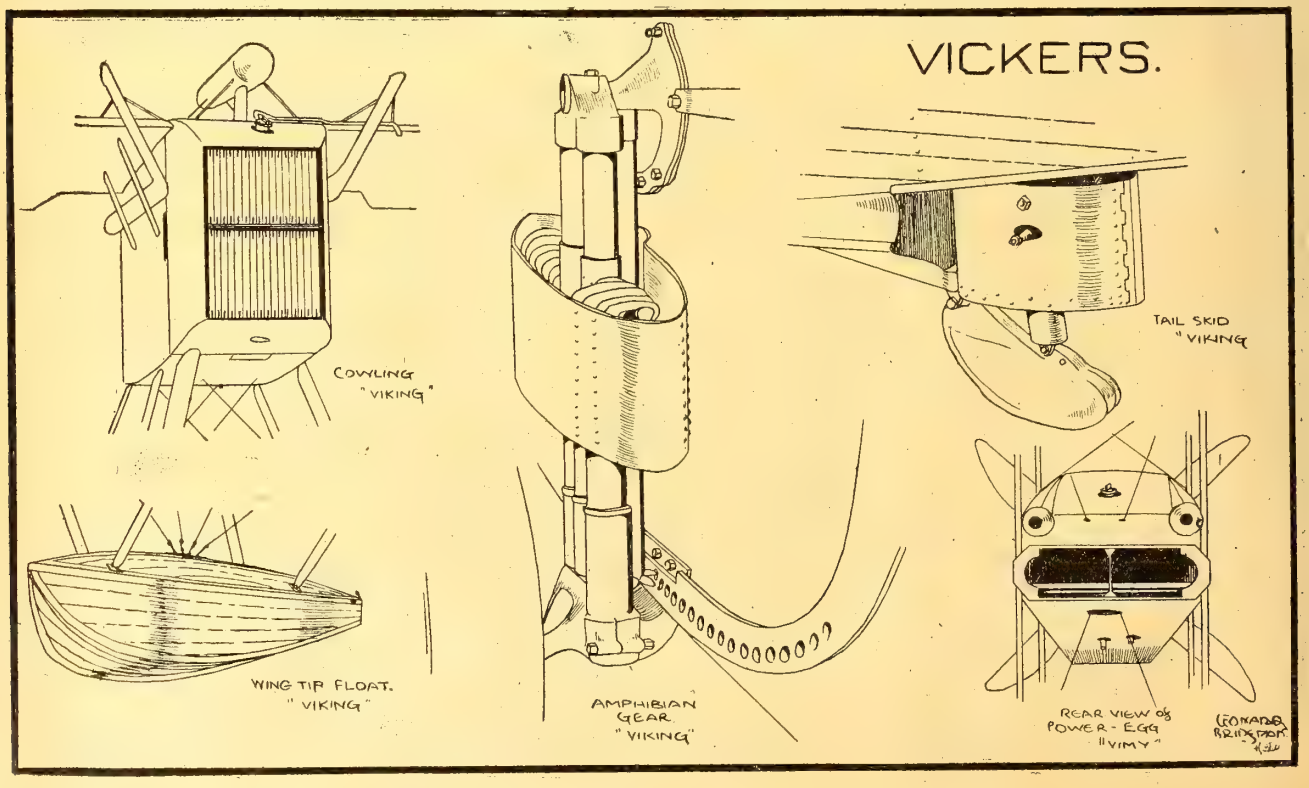
As an example of the thoroughly practical nature of the Supermarine boats, one would like readers to note the fact that last year six of the "Channel Type" boats with six pilots and eight mechanics were in operation daily for five months. During that time they covered somewhere between twenty-five and thirty thousand sea miles. The biggest replacement during that period was one wing-tip float, and the total upkeep of the six boats, apart from fuel and oil, was £320. Anybody who desires confirmation of these figures is, one gathers, quite welcome to inspect the firm's books for themselves.

VICKERS, LTD., Basil Court, Knightsbridge.

Quite naturally the chief attraction on the Vickers' stand is the Vickers amphibian, known officially at the "Viking," which is, in fact, the only amphibian in the Show exhibited as such. One is inclined to regard the Vickers "Viking" as being, at any rate, a very large stride in the right direction, though Mr. Pierson, the designer, and the constructors modestly say that it is purely an experimental affair. Certainly for passenger work, especially where there are large rivers and lakes, a flying-boat with wheels strikes one as being a more companionable vehicle than a seaplane with an amphibian undercarriage.

The whole of the body is of the famous Saunders "Consuta" material, in which layers of wood in thin strips are cemented and sewn into large sheets, which are then cut to sizes appropriate to their purpose.

The landing carriage is a singularly neat arrangement in which the wheels are carried on a frame working from an axle lying across the deck of the hull. On the sides of the hull are thick brass strips bent to the radius along which the wheels rise and descend, and in this strip is a series of holes, each hole representing what would be a cog in an ordinary rack-and-pinion arrangement. In place of the cog wheel there is a little wheel with projecting knobs, which knobs engage in the aforesaid holes, the knobs themselves acting as the teeth of the cog wheel. The principle is something like that employed in the old "Quadrant" chainless bicycles and



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in the "Humphriss" gear for motor-cars. Evidently the principle works quite well in practice.

Behind the second step of the hull there is a tail-skid mounted on a steel tube and on the steel tube is a rudder. Thus the same steering arrangement acts as a steering tail-skid on land or as a water rudder when in the water. Both are worked in conjunction with the ordinary air rudders.

The hull contains a seat for the pilot and a passenger in the nose and seats for two passengers side by side behind them. Right aft behind the screw is a seat for a fourth passenger.

The wing structure is an ordinary biplane of the usual excellent Vickers' construction. The tail unit is also a biplane with three rudders, each of which is slightly balanced.

A striking feature of the machine is the peculiar design of the airscrew, which resembles an ordinary water screw very strongly. It is a four-blader with very wide blades. This curious design is an effort to absorb efficiently the full power of the Rolls-Royce "Eagle" engine without raising the engine so high as to give the top-hamper too much leverage when on the water, and without raising the line of thrust of the airscrew to such an extent as to make longitudinal control difficult.

It is particularly interesting to note that a kinematograph film illustrating the amphibian manœuvres of the "Viking" will be shown daily throughout the show at the free kinematograph entertainment provided in the gallery. The film in question is not only extremely instructive, but it is quite one of the most amusing that has appeared.

There is something extraordinarily comic about the sight of this great machine taxying down a slipway under its own power, walking into the sea, flying off, returning, taxying up to the beach, and waddling out of the water like some strange animal of the sea. All who visit Olympia should, at any rate, make an attempt to see this film, for it will give them a better idea than any description can of the real utility of the amphibian type.

SPECIFICATION OF THE VICKERS "VIKING."

Span	46 ft.	Surface	550 sq. ft.
Chord	6 ft.	Weight (full)	4,545 lb.
Gap	7 ft.	Engine	Rolls-Royce "Eagle VIII."
Length	32 ft.		
Height	13 ft.		

THE "VIMY."

The other notable exhibit on the Vickers stand is one of the standard commercial "Vimys" with two Rolls-Royce "Eagle" engines. The body is of the familiar "Easter Egg" type, but several minor refinements have been introduced since the first of the type appeared.

In the original the forward part of the hull was merely a luggage locker. Now the passengers' seats are carried right forward to the front. The big luggage door is retained as a kind of emergency exit, which is good.

A neat little refinement in the entrance arrangement is fitted by making the let-down door behind the trailing edge of the lower wing into a series of steps, so that instead of having to carry a ladder to the side of the machine the door merely drops on the ground and the passengers can walk in or out.

There is also a door from the passengers' compartment to the front seat where the pilot and mechanic sit, so that passengers can have "a seat on the box," so to speak, in turn, or, as an official of the firm remarked: "If one does not like the pilot's methods, one can pull him off his seat and take charge oneself."

Another minor refinement about the machine, but one which is of very considerable importance to air lines who intend to operate with "Vimys," is that the upper surface of the lower plane in the neighbourhood of the engine is now arranged with a metal covering and cross slats, so that mechanics working on the engine can walk on the surface of the plane without damaging it.

SPECIFICATION OF THE VICKERS "VIMY."

Span	67 ft.	Weight (full)	12,500 lb
Chord	10 ft. 6 in.	Weight (empty)	—
Gap	10 ft.	Engines	Two Rolls-Royce "Eagle VIIIs."
Length	42 ft. 8 in.		
Height	15 ft.		
Surface	1,400 sq. ft.	Speed	100 m.p.h.

VICKERS SUNDRIES.

The rest of the Vickers' stand is full of interest. There are quite a number of models which are well worth seeing.

For example there is a one-tenth scale model of the original "Vimy" bomber of the type used in the first direct trans-Atlantic flight; and in the flight from London to Australia and from London to South Africa. There is one-twentieth scale model of a commercial "Vimy" in a skeleton of a Vickers-built shed designed expressly for this type of machine. So skeletonised in fact is the shed that a rival aircraft constructor asked the Chief of the Vickers' exhibit when the firm had taken to supplying fretwork outfits for amateurs.

Another interesting model is of the big Vickers-Saunders "Valentia" flying-boat, designed to carry a useful load of 2¼ tons. Also there is considerable sentimental interest in the models of the old Vickers' Gun-bus, the first fighting aeroplane used by the Allies in the Great War.

Other exhibits include a show board on which are mounted a number of the products of the various Vickers' works, such for example as centrifugal petrol pumps, petrol cocks, petrol relief and bye-pass valves, Vickers' flow indicators, petrol filters, water filters and so forth. S. E. Saunders, Ltd., of Cowes, show two wing floats built for the Vickers-Saunders "Valentia" boat of the patent Saunders "Consuta" ply-wood. These floats are each big enough to make a respectable dinghy for a yacht, so that they give one some faint idea of the colossal size of the "Valentia" herself.

There are also specimens of aeroplane spars made of duralumin. The raw materials constructed by the firm, such as crank shafts, connecting rods, axle tubes, magnets and so forth are shown, and there is a case showing various small tools such as drills, reamers, and milling cutters, which are made by the Vickers' firm.

THE WESTLAND AIRCRAFT WORKS, YEOVIL.

The Westland Aircraft Works show a Mark II Limousine. This differs from the original Limousine in a variety of ways.

In the first place, instead of the "Falcon" Rolls-Royce engine it has a 300 h.p. Hispano-Suiza. An excellent modification is effected by removing the petrol tanks from the inside of the fuselage and carrying the petrol in two torpedo-shaped tanks each containing 29 gallons, slung under the lower plane at the junction of the first row of interplane struts with the spars. In this way considerably greater space is made available in the fuselage for the carriage of mails or goods, but perhaps the greatest advantage of all is the additional security it gives against fire.

The real danger of fire is not the initial ignition of petrol in the carburetter through a back-fire or a defective valve, but the fact that when this first small fire takes place it sets fire to the main petrol supply of the machine either through the burning out of the petrol connection while in the air, or through the tank bursting on hitting the ground in a crash. By removing the tanks to a point several feet from the carburetter there is no fear whatever of their catching fire in the air, and in the event of a crash the chances are that the main petrol supply will not at any rate fall on the flames caused by what petrol is left in the carburetter.

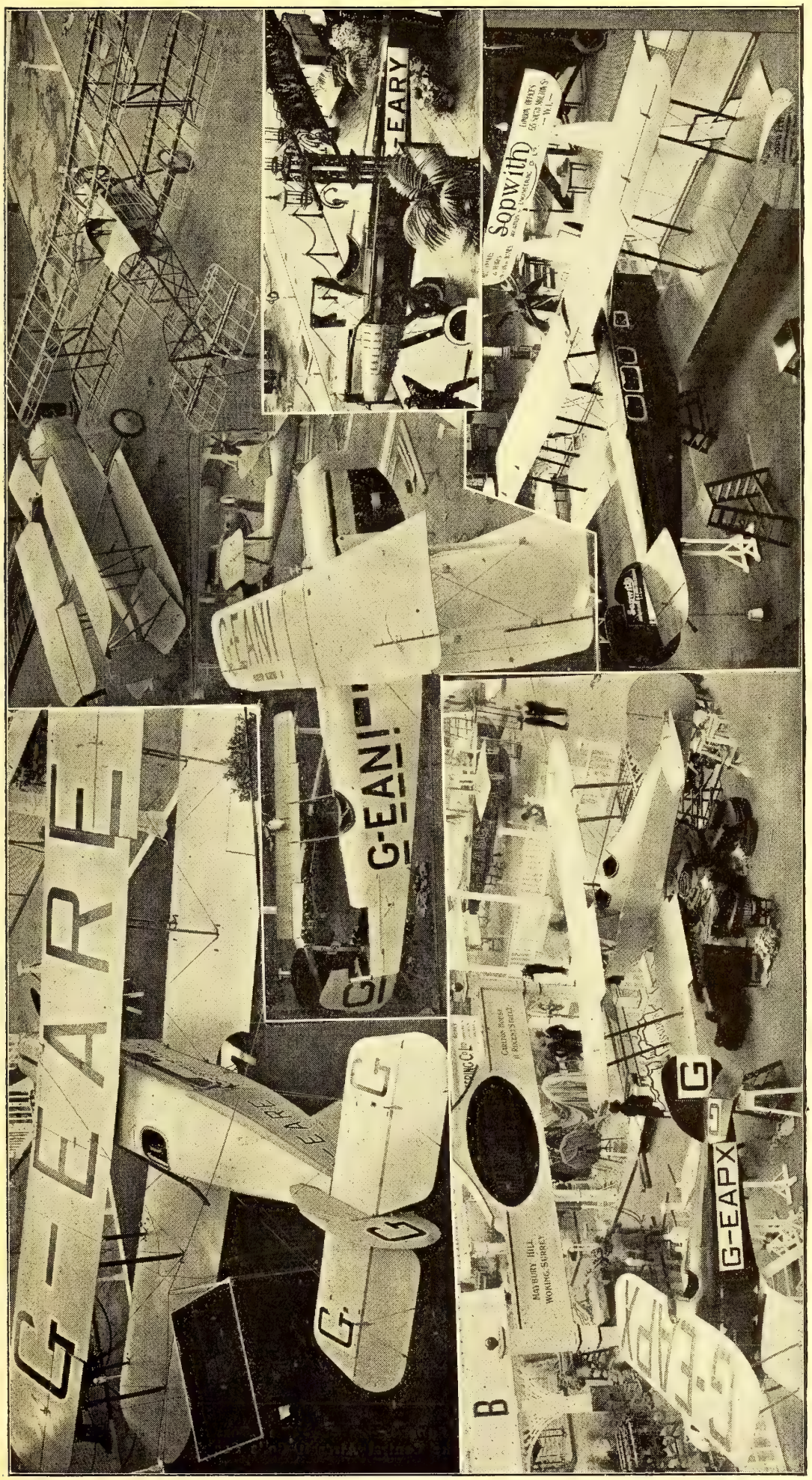
To guard still further against fire a perfectly fireproof bulkhead is fitted between the engine and the rest of the fuselage. This bulkhead is covered with aluminium and asbestos so that there is no fear of carburetter fire setting light to the interior of the fuselage.

The machine in its new form carries a load of three passengers plus 230 lb. of goods, which, reckoning that the passengers are ordinary standard-type human beings, works out at a load of 8.17 lb. per sq. ft. of surface. The increased petrol capacity gives a duration capacity of 4½ hours at a cruising speed of about 90 m.p.h.

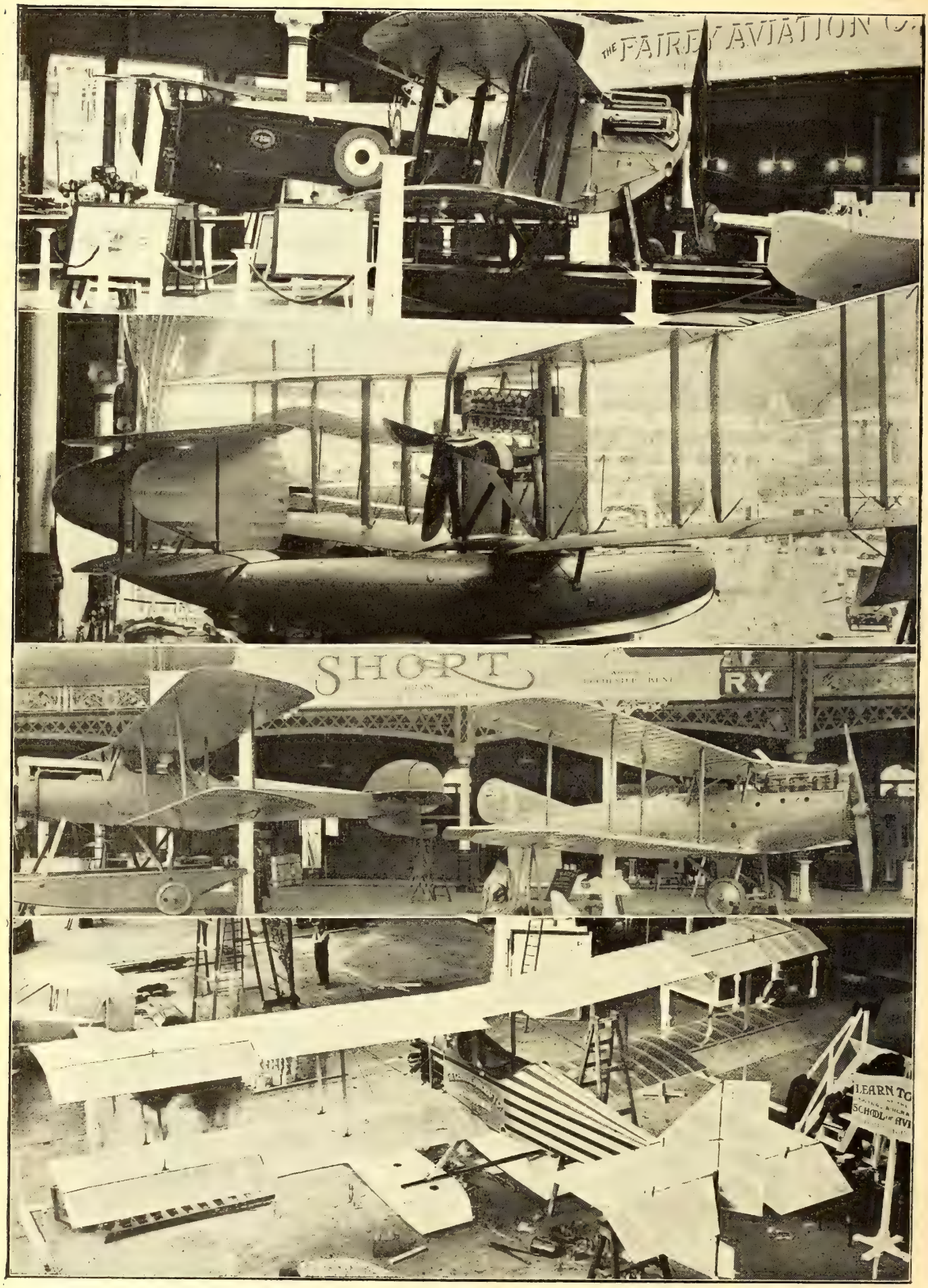
A particularly neat feature about the machine is the way in which the engine is mounted. The big steel tubes which formed the engine bearers for the Rolls-Royce are an integral part of the fuselage structure, and by a very simple arrangement of three-ply girders the Hispano-Suiza engine can be dropped into the same fittings.

This particular machine bears on its side the legend "Air Post of Banks, Limited," from which one gathers that it is intended to use this very excellent type of machine on the new air line from London to Lisbon via Paris—to which reference was made in a guarded manner in this paper two or three weeks ago. The choice is undoubtedly a good one, for there is certainly no better built or better designed machine on the market.

From a purely personal point of view one appreciates the wisdom of having not only a door in one side from which one can extract oneself from the machine in the case of a turn-over in landing, but also the opening of the pilot's cockpit in the top of the machine, so that in the event of the machine falling in such a manner that the door is blocked by damaged wings, it is possible to get out by way of the pilot's seat.



AT OLYMPIA.—Left Top, the Westland "Limousine" in Plan View. Right Top, the two Austin "Whippets." Left Bottom, the Martinsyde "Semiquaver" (G-EAPX) and the two-seater. Middle, the B.A.T. "Commercial Mark I." Middle Right, the Beardmore. Right Bottom, the Sopwith "Antelope."



AT OLYMPIA.—Top, the Fairey Seaplane. Second, the Supermarine "Channel" Boat. Third, the Short Seaplane and All-Metal Biplane. Bottom, the Central Aircraft Co.'s Seaplane.

. THE .

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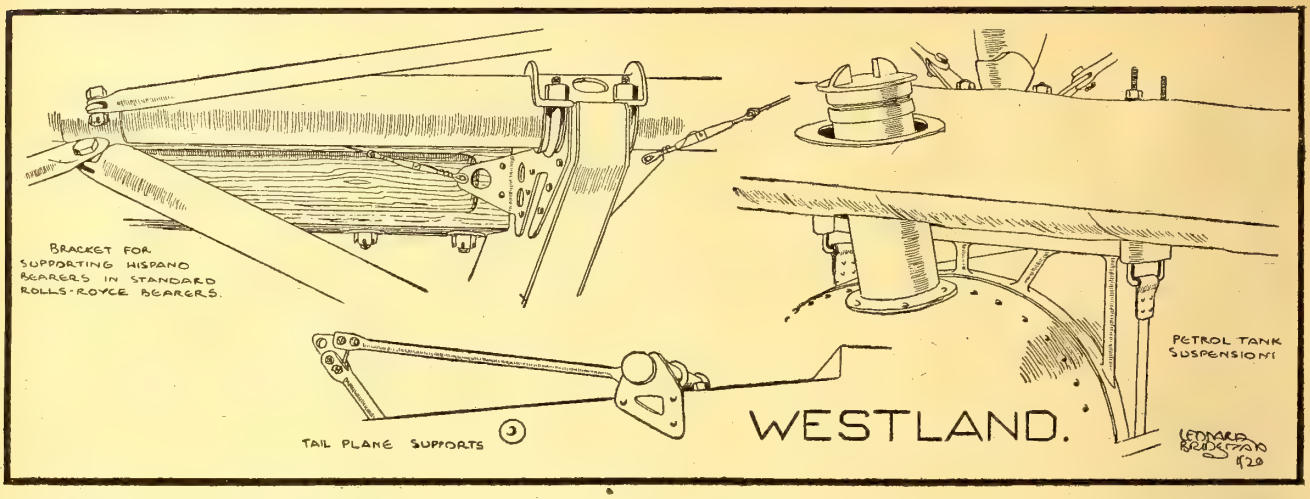
The latest issue of **L'AIR** may be purchased at the AEROPLANE stand, price 6d.



One does not imagine that this emergency exit will be frequently needed, for the "Westland" is such an easy machine to fly that any competent pilot should be able to get it down almost anywhere without damage, but it is just as well to provide emergency exits even in the best aeroplanes, just as emergency exits are provided in the best theatres although one does not do so in immediate expectation of a fire.

On the same stand as the complete machine there is shown the after part of a fuselage of a similar machine. This is shown without upholstery or fittings of any kind, so that those who are interested in the details of aeroplane construction, especially with a view to purchases for aerial transport firms, can satisfy themselves as to the excellence of the workmanship done at the Westland works, and the lateral strength against twisting strains of this particular type of construction. The way in which three-ply bulkheads are used to stiffen the fuselage is distinctly ingenious.

Mr. Robert Bruce, the director of the Westland Company, is distinctly to be congratulated on the excellent and convincing impression conveyed by this machine, and one has no doubt that as soon as aerial transport companies really get to work the firm will find a very considerable demand for their machines.

SPECIFICATION.

Span	37 ft. 9 in.	Engine	300 h.p. Hispano-Suiza
Chord	5 ft. 3 in.		
Gap	6 ft.	Weight (full)	3,800 lb.
Length	29 ft. 6 in.	Weight (empty)	2,450 lb.
Height	10 ft. 9 in.	Speed	115 m.p.h.
Surface	...	Climb	5,000 ft. in 6 min.

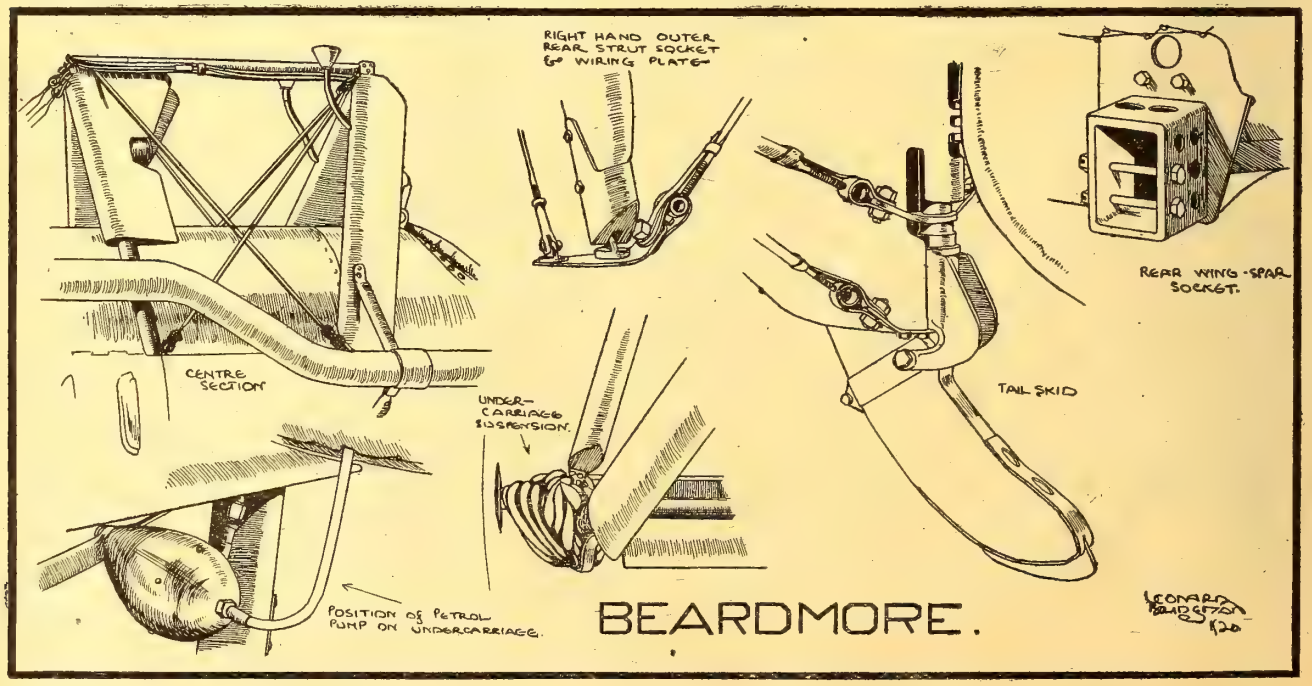
ANOTHER LIVE FIRM.

Jonas and Colver, Ltd., writing on July 2nd, say: "We are members of the S.B.A.C. During the war we were one of the largest suppliers of aircraft steel. At the request of the Government we put down a very large plant so as to increase our production of these special steels. We still supply aircraft steel to several of the leading firms, and shall continue to do so according to the demand. We have on our staff a number of experts who are constantly engaged in maintaining and improving the standard of the steels in manufacture. We shall be much obliged if you will see that our firm's name is added to the list of those supplying aircraft steels." It is much to be regretted that this eminent firm's reply was received too late for inclusion in the list published on June 30th.

ETERNAL SPRING.

Herbert Terry and Sons, Ltd., the famous spring specialists of Redditch, write regretting that the absence of one of their chief officials into whose department the inquiry was received caused delay in answering the questionnaire recently sent out to the Aircraft Industry from this office. The firm say, "We are handling such aircraft material orders as come our way, as regards springs, presswork, wirework, washers, hose clips, and flexible shafts. We hope to be able to co-operate with aircraft producers in the future, and are willing to render whatever service is possible. With this end in view we are regularly advertising in the aircraft journals, including, of course, THE AEROPLANE. If you are able to influence orders our way we shall appreciate it very much, and they shall have our very best attention."

As one who has known Herbert Terry and Sons, Ltd., for at least twenty years, during which time one has never had cause to complain of any bad quality of their products, the writer has no hesitation in recommending everybody who may be in want of springs or anything of a like nature to deal with this excellent and old-established firm.



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Austin Motors, Ltd.	"Whippet"	Anzani 50	Pilot	Personal Luggage	21	6	3	8	3	10
Wm. Beardmore & Co.	W.B.2	Beardmore 160	Pilot	340	35	0	5	6	5	6
Wm. Beardmore & Co.	W.B.10	Beardmore 160	Pilot	500	46	0	—		—	
The Blackburn Aeroplane & Motor Co., Ltd.	"Swift"	Napier "Lion" 450	Pilot	1975	48	6	8	0	7	6
The Bristol Aeroplane Co., Ltd.	"Coupé"	Siddeley "Puma" 230	Pilot	400	39	5	5	6	5	6
The Bristol Aeroplane Co., Ltd.	"Pullman"	"Liberty" (4) 400	Pilots (2), Mech.	2520	81	8	8	6	7	0
The British Aerial Transport Co.	Commercial (Mk. I)	Rolls-Royce "Eagle" 375	Pilot	1000	46	0	6	6	6	6
The British Aerial Transport Co.	"Bantam"	A.B.C. "Wasp II" 200	Pilot	398	25	0	3	11¼	3	3
The British Aerial Transport Co.	"Crow"	A.B.C. 40	Pilot	Personal Luggage	19	0	4	0	—	
Central Aircraft Co., Ltd.	"Centaur" 4b	Anzani 100	Pilot	670	39	1	5	0	5	0
Fairey Aviation Co., Ltd.	XXI	Napier "Lion" 450	Pilot, Gunner	—	40	0	6	0	5	9
Martinsyde, Ltd.	"Semiquaver"	Hispano-Suiza 300	Pilot	—	20	2	4 4	10½ t. 0 b.	4	0
Martinsyde, Ltd.	F.4a	Hispano-Suiza 300	Pilot	280	32	9	6 5	0½ t. 6¼ b.	5	2½
Martinsyde, Ltd.	A (Mk. II)	Hispano-Suiza 300	Pilot	1200	43	4	6	3	5	6
Handley Page, Ltd.	W.8	Napier (2) "Lion" 450	Pilot, Mech.	1½-2 tons	75	0	10	0	—	
Henri Potez	Type VIII	H. Potez 50	Pilot	160 kg.	26	3	4	6	4	6
A. V. Roe & Co., Ltd.	548	Renault 80	Pilot	605	36	0	4	9¾	5	6
A. V. Roe & Co., Ltd.	"Baby" 534	Green 35	Pilot	254	25	0	4	0	4	3
A. V. Roe & Co., Ltd.	Triplane 547a	Siddeley "Puma" 230	Pilot	1700	37	0	4	9¾	4	5
Short Bros.	"Shrimp"	Beardmore 160	Pilot	480	44	0	6	0	5	6
Short Bros.	"Swallow"	Siddeley "Puma" 230	Pilot	400	37	6	5	3	4	6
Sopwith Aviation Co., Ltd.	"Dove"	Le Rhône 80	Pilot	180	24	9½	5	1½	4	6
Sopwith Aviation Co., Ltd.	"Gnu"	B.R.2 230	Pilot	360	38	1	5	6	5	0
Sopwith Aviation Co., Ltd.	"Antelope"	Wolseley "Viper" 180	Pilot	360	46	5	6	3	6	0
Supermarine Aviation Works, Ltd.	"Channel"	Beardmore 160	Pilot	540	50	5¼	5	6	7	0
Supermarine Aviation Works, Ltd.	"Sea King"	Beardmore 160	Pilot	230	30	5	5	6	6	2½
Vickers Ltd.	Commercial "Vimy"	Rolls-Royce (2) "Eagle" 375	2 Pilots	1,800	67	0	10	6	10	0
Vickers Ltd.	"Viking"	Rolls-Royce "Eagle" 375	Pilot	900	4[illegible]	0	6	0	7	0
Westland Aircraft Works	"Limousine"	Hispano-Suiza 300	Pilot	770	37	9	6	3	6	0

* Useful load given does not include pilot, fuel or oil. E

IMPRESSIONS OF THE SHOW.

By a Thoroughly Irresponsible Contributor.

During the War, and later still, during the so-called Peace, one has frequently discussed the probable site of the next Aero Show. Most people seemed to agree that Olympia could not be used as it could only house about one big aeroplane. And yet, in fact, unless one is actually within a short distance one hardly notices the Bristol triplane, the Vickers "Vimy," or the W.8, while an o/400 Handley Page is tucked away in the annexe and is hardly seen.

On coming in at the main entrance a most startling and interesting fact is brought to light; there it is stated in black and white for all to see. Cold hard facts, so one is no longer left in horrid suspense. The Sopwith Aviation and Engineering Company, Ltd., had built to its designs during the war 11,237 aeroplanes for the British Government and 5,000 for the Allies. Three very interesting machines built since the war are shown. People can be seen playing for hours with the ingenious back seat in the "Antelope."

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Length. Ft.	In.	Height. Ft.	In.	Wing Surface Sq. Ft.	Hours Fuel	Wgt Empty Lb.	Wgt. Loaded Lb.	Lb. per Sq. Ft.	Lb. per H.P.	Max. Speed in m.p.h.	Landg. Speed	Climb. Feet in Min.		Ceiling. Ft.	Remarks.
16	3	7	6	140	2.0	580	810	5.9	16.0	95.0	35	10,000	22	—	Single-seater tourer
27	7	10	11	354	3.9	1,751	2,516	7.1	15.7	107.0	55	10,000	25	16,000	3-seater
26	0	11	10	—	5.9	1,852	2,849	5.6	17.8	91.0	40	10,000	27	14,000	2-seater
33	6	12	0	720	4.5	—	6,000	8.3	13.1	98kt	43	850	—	15,000	Torpedo carrier
26	0	9	6	405	7.0	1,900	3,100	7.8	13.0	115.0	48	10,000	15	20,000	3-seater
52	0	20	0	1905	5.0	11,000	17,750	9.3	10.2	125.0	55	10,000	12	15,000	Passenger Limousine.
34	0	11	3	580	6.0	2,700	4,500	7.7	13.0	115.0	45	—	—	—	5-seater
18	5	6	9	185	3.5	953	1,618	8.7	8.0	150.0	50	10,000	7½	26,000	Single-seater fighter
14	0	5	0	76	2.0	220	450	6.0	11.0	65.0	30	—	—	—	Monoplane
27	1	9	6	380	3.0	1,230	1,900	4.94	18.75	84.0	34	10,000	34	18,000	3-seater seaplane
30	0	11	6	440	(Particulars for these figures are not available by orders of the Air Ministry.)										Data not available
19	3	7	3	147	1.75	1,425	2,025	13.8	6.7	161.5	65	3,000	1	—	Racing machine
25	8	8	10 without airscrew	299	2.5	1,560	2,300	7.0	7.5	142.0	44	10,000	7½	24,000	2-seater
29	1½	10	6	487	5.0	—	4,000	7.75	14.5	115.0	40	10,000	12	21,000	5-seater
60	0	—		1500	—	—	—	—	16.0	(Majority of data not obtainable.)					
18	2	7	0	190	3.0	500	950	5.0	20.0	—	—	—	—	—	2-seater touring model
29	5	10	5	330	—	1,338	1,943	5.89	24.5	80.0	40	7,000	23.3	10,000	3-seater
19	3	7	6	176.5	12.0	616	870	4.93	21.75	80.0	35	9,000	35	10,000	Sporting type
29	10	14	5	498	—	2,080	3,286	6.6	13.7	100.0	45	10,000	19	10,000	5-seater limousine
33	0	12	0	500	3.0	2,095	3,100	6.2	15.5	83.0	38	10,000	35	12,000	4-seater seaplane
26	5	10	6	370	3.0	1,865	2,870	7.86	11.0	120.0	38	10,000	11	22,000	All metal mail carrier
19	6	9	6	240	2.75	850	1,430	6.7	17.9	100.0	40	5,000	7½	—	2-seater
25	5	10	0	380	3.25	1,215	2,160	6.1	19.6	93.0	40	5,000	7¾	17,000	3-seater
30	6	11	0	550	4.0	2,100	3,000	5.7	15.75	100.0	38	5,000	7½	20,000	3-seater
30	0	13	0	453	3.75	2,356	3,400	7.5	9.0	70kt	46kt	3,000	15	10,000	Flying-boat, 4-seater
24	0	10	3	284	3.0	2,250	2,560	9.0	14.4	96kt	50kt	10,000	20	12,500	Flying-boat, fighter
42	8	15	0	1400	5.0	—	12,500	—	—	100.0	—	—	—	—	Commercial passenger & mail carrier
32	0	13	0	550	—	—	4,545	—	—	—	—	—	—	—	Amphibian flying-boat
29	6	10	9	435	4.5	2,450	3,800	8.7	12.6	115.0	55	5,000	6	15,000	4-Seat mail machine

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Name of Manufacturer.	Name of Type.	Engine & H.P	Crew.	Useful Load, Lb.*	Span. Ft.	Span. In	Chord. Ft.	Chord. In.	Gap. Ft.	Gap. In	Length. Ft.	Length. In.	Height. Ft.	Height. In.	Wing Surface Sq. Ft.	Hours Fuel	Wgt Empty Lb.	Wgt. Loaded Lb.	Lb. per Sq. Ft.	Lb. per H.P.	Max. Speed	Landg. Speed in m.p.h.	Climb. Feet in Min.		Ceiling. Ft.	Remarks.
Austin Motors, Ltd.	"Whippet"	Anzani 50	Pilot	Personal Luggage	21	6	3	8	3	10	16	3	7	6	140	2.0	580	810	5.9	16.0	95.0	35	10,000	22	—	Single-seater tourer
Wm. Beardmore & Co.	W.B.2	Beardmore 160	Pilot	340	35	0	5	6	5	6	27	7	10	11	354	3.9	1,751	2,516	7.1	15.7	107.0	55	10,000	25	16,000	3-seater
Wm. Beardmore & Co.	W.B.10	Beardmore 160	Pilot	500	46	0	—		—		26	0	11	10	—	5.9	1,852	2,849	5.6	17.8	91.0	40	10,000	27	14,000	2-seater
The Blackburn Aeroplane & Motor Co., Ltd.	"Swift"	Napier "Lion" 450	Pilot	1975	48	6	8	0	7	6	32	6	12	0	720	4.5	—	6,000	8.3	13.1	98kt	43	850	—	15,000	Torpedo carrier
The Bristol Aeroplane Co., Ltd.	"Coupé"	Siddeley "Puma" 230	Pilot	400	39	5	5	6	5	6	26	0	9	6	405	7.0	1,900	3,100	7.8	13.0	115.0	48	10,000	15	20,000	3-seater
The Bristol Aeroplane Co., Ltd.	"Pullman"	"Liberty" (4) 400	Pilots (2), Mech.	2520	81	8	8	6	7	0	52	0	20	0	1905	5.0	11,000	17,750	9.3	10.2	125.0	55	10,000	12	15,000	Passenger Limousine.
The British Aerial Transport Co.	Commercial (Mk. I)	Rolls-Royce "Eagle" 375	Pilot	1000	46	0	6	6	6	6	34	0	11	3	580	6.0	2,700	4,500	7.7	13.0	115.0	45	—	—	—	5-seater
The British Aerial Transport Co.	"Bantam"	A.B.C. "Wasp II" 200	Pilot	398	25	0	3	11½	3	3	18	5	6	9	185	3.5	953	1,618	8.7	8.0	150.0	50	10,000	7½	26,000	Single-seater fighter
The British Aerial Transport Co.	"Crow"	A.B.C. 40	Pilot	Personal Luggage	19	0	4	0	—		14	0	5	0	76	2.0	220	450	6.0	11.0	65.0	30	—	—	—	Monoplane
Central Aircraft Co., Ltd.	"Centaur" 4b	Anzani 100	Pilot	670	39	1	5	0	5	[illegible]	27	1	9	6	380	3.0	1,230	1,900	4.94	18.75	84.0	34	10,000	34	18,000	3-seater seaplane
Fairey Aviation Co., Ltd.	XXI	Napier "Lion" 450	Pilot, Gunner	—	40	0	6	0	5	9	30	0	11	6	440	(Particulars for these figures are not available by orders of the Air Ministry.)										Data not available
Martinsyde, Ltd.	"Semiquaver"	Hispano-Suiza 300	Pilot	—	20	2	4 4	10½ t. c b.	4	0	19	3	7	3	147	1.75	1,425	2,025	13.8	6.7	161.5	65	3,000	1	—	Racing machine
Martinsyde, Ltd.	F.4a	Hispano-Suiza 300	Pilot	280	32	9	6 5	0½ t. 6¼ b.	5	2½	25	8	8 without airscrew	10	299	2.5	1,560	2,300	7.0	7.5	142.0	44	10,000	7½	24,000	2-seater
Martinsyde, Ltd.	A (Mk. II)	Hispano-Suiza 300	Pilot	1200	43	4	6	3	5	6	29	1½	10	6	487	5.0	—	4,000	7.75	14.5	115.0	40	10,000	12	21,000	5-seater
Handley Page, Ltd.	W.8	Napier (2) "Lion" 450	Pilot, Mech.	1½-2 tons	75	0	10	0	—		60	0	—		1500	—	—	—	—	16.0	(Majority of data not obtainable.)					
Henri Potez	Type VIII	H. Potez 50	Pilot	160 kg.	26	3	4	6	4	6	18	2	7	0	190	3.0	500	950	5.0	20.0	—	—	—	—	—	2-seater touring model
A. V. Roe & Co., Ltd.	548	Renault 80	Pilot	605	36	0	4	9¾	5	6	29	5	10	5	330	—	1,338	1,943	5.89	24.5	80.0	40	7,000	23.3	10,000	3-seater
A. V. Roe & Co., Ltd.	"Baby" 534	Green 35	Pilot	254	25	0	4	0	4	3	19	3	7	6	176.5	12.0	616	870	4.93	21.75	80.0	35	9,000	35	10,000	Sporting type
A. V. Roe & Co., Ltd.	Triplane 547a	Siddeley "Puma" 230	Pilot	1700	37	0	4	9¾	4	5	29	10	14	5	498	—	2,080	3,286	6.6	13.7	100.0	45	10,000	19	10,000	5-seater limousine
Short Bros.	"Shrimp"	Beardmore 160	Pilot	480	44	0	6	0	5	6	33	0	12	0	500	3.0	2,095	3,100	6.2	15.5	83.0	38	10,000	35	12,000	4-seater seaplane
Short Bros.	"Swallow"	Siddeley "Puma" 230	Pilot	400	37	6	5	3	4	6	26	5	10	6	370	3.0	1,865	2,870	7.86	11.0	120.0	38	10,000	11	22,000	All metal mail carrier
Sopwith Aviation Co., Ltd.	"Dove"	Le Rhône 80	Pilot	180	24	9½	5	1½	4	6	19	6	9	6	240	2.75	850	1,430	6.7	17.9	100.0	40	5,000	7½	—	2-seater
Sopwith Aviation Co., Ltd.	"Gnu"	B.R.2 230	Pilot	360	38	1	5	6	5	0	25	5	10	0	380	3.25	1,215	2,160	6.1	19.6	93.0	40	5,000	7¾	17,000	3-seater
Sopwith Aviation Co., Ltd.	"Antelope"	Wolseley "Viper" 180	Pilot	360	46	5	6	3	6	0	30	6	11	0	550	4.0	2,100	3,000	5.7	15.75	100.0	38	5,000	7½	20,000	3-seater
Supermarine Aviation Works, Ltd.	"Channel"	Beardmore 160	Pilot	540	50	5¼	5	6	7	0	30	0	13	[illegible]	453	3.75	2,356	3,400	7.5	9.0	70kt	46kt	3,000	15	10,000	Flying-boat, 4-seater
Supermarine Aviation Works, Ltd.	"Sea King"	Beardmore 160	Pilot	230	30	5	5	6	6	2½	24	0	10	3	284	3.0	2,250	2,560	9.0	14.4	96kt	50kt	10,000	20	12,500	Flying-boat, fighter
Vickers Ltd.	Commercial "Vimy"	Rolls-Royce (2) "Eagle" 375	2 Pilots	1,800	67	0	10	6	10	0	42	8	15	0	1400	5.0	—	12,500	—	—	100.0	—	—	—	—	Commercial passenger & mail carrier
Vickers Ltd.	"Viking"	Rolls-Royce "Eagle" 375	Pilot	900	45	0	6	0	7	0	32	0	13	0	550	—	—	4,545	—	—	—	—	—	—	—	Amphibian flying-boat
Westland Aircraft Works	"Limousine"	Hispano-Suiza 300	Pilot	770	37	9	6	3	6	0	29	6	10	9	435	4.5	2,450	3,800	8.7	12.6	115.0	55	5,000	6	15,000	4-Seat mail machine

* Useful load given does not include pilot, fuel or oil. E ch passenger has been reckoned at 180 lb.

IMPRESSIONS OF THE SHOW.

By a Thoroughly Irresponsible Contributor.

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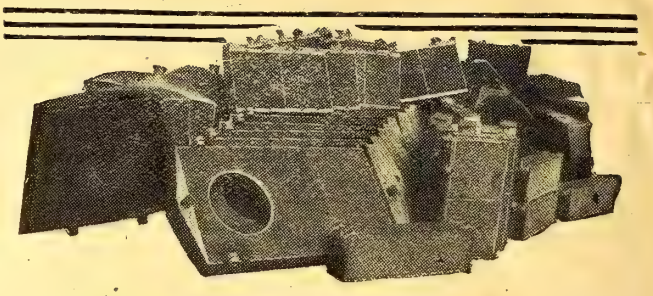

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RADIATORS

for Airships and Aeroplanes

at the AERO SHOW, OLYMPIA

STAND 30.

SERCK'S exhibit of Aeroplane and Airship Radiators, at the Aero Show, Olympia, will well repay a visit.

Serck Radiators, Ltd., are the largest manufacturers in the Kingdom. Radiators by Serck have a wide reputation for efficiency—the fruits of 13 years' experience in all branches of the business.

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OFFICIAL NOTICES.

NOTICE TO AIRMEN, No. 78.

AIR MINISTRY, July 7th.

It is hereby notified that:—

Demonstrations of lights, flares, rockets and signal grenades in connection with practice at the Small Arms School take place about 500 yards west of Hythe.

The arrangement of these displays depends to some extent upon the weather, and a practice may be appointed any day or night in such way as to preclude any notice being given.

Airmen are warned against mistaking these displays for aerodrome or landing signals.

NOTICE TO AIRMEN, No 79.

AIR MINISTRY, July 9th

It is hereby notified that:—

Notice to Airmen, No. 63, issued on June 3rd, is only operative provided that pilots of aircraft wishing to land in Egypt have first obtained permission from the Local Authorities.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
July 5th	S.N.E.T.A.	DH9	O-BEIN	Brussels	Croydon	—	16 15	Photos	Nil	George
	S.N.E.T.A.	DH9	O-BEIN	Croydon	Brussels	17.20	19.50	Nil	Nil	George
July 6th	A.T. & T.	DH16	G-EAPM	London	Paris	09 47	12 35	Mail	4	Tebbitt
	A.T. & T.	DH16	G-EALM	London	Amsterdam	09 48	12 28	Goods	1	Armstrong
	A.T. & T.	DH9	G-EAQL	London	Paris	09 59	13.10	Goods	1	Baylis
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10 10	12.54	Nil	1	Holmes
	I.A.L.	DH4a	G-EAMU	London	Paris	10.08	12.25	Nil	2	Barnard
	A.T. & T.	DH9	G-EAGX	London	Paris	15.40	18 10	Goods	1	Bradley
	H.P. & M.A.	Salmson	F-CMAE	London	Paris	18.45	—	Nil	Nil	Challaux
	A.T. & T.	DH9	G-EAQN	Paris	London	09.55	10.18	Nil	Nil	Bradley
						5th				
	I.A.L.	DH4a	G-EAMU	Paris	London	14.45	16.45	Goods	1	Barnard
	A.T. & T.	DH9	G-EAGY	Paris	London	—	16.20	Nil	2	Bamber
	A.T. & T.	DH16	G-EALU	Paris	London	—	18.20	Nil	3	McMullin
	A.T. & T.	DH9	G EAPL	Amsterdam	London	15 00	18.25	Gd's&M	Nil	Holmes
July 7th	A.T. & T.	DH16	G-EALU	London	Paris	09.50	12.45	Mail	3	Robbins
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10 30	14 10	Goods	Nil	Holmes
	A.T. & T.	DH9	G-EAQN	London	Amsterdam	12.15	15.20	Nil	1	Hinchcliffe
	A T. & T.	DH18	G-EARI	St. Inglevert	London	14.55	15 53	Nil	Nil	Powell
	C.T.	Nieuport	F-CGTE	Paris	London	15.30	10.05	Mail	Nil	Hanin
							8th			
	A.T. & T.	DH9	G-EAQL	Paris	London	15 40	17.47	Nil	2	Forson
	A.T. & T.	DH16	G-EAPM	Paris	London	15.45	17.47	Nil	3	Baylis
	A.T. & T.	DH9	G-EAGX	Paris	London	15 45	17.47	Nil	2	Tebbitt
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.00	17.50	Nil	1	Armstrong
July 8th	A.T. & T.	DH16	G-EAQS	London	Paris	09.50	12.10	Mail	4	Baylis
	A.T. & T.	DH16	G-EAPM	London	Paris	10.00	13 55	Nil	2	Powell
	A.T. & T.	DH16	G-EALM	London	Amsterdam	10.30	13.22	Goods	Nil	Armstrong
	A T. & T.	DH9	G-EAGX	London	Paris	11.00	14.20	Nil	1	Lines
	I A.L.	DH4a	G-EAMU	London	Paris	12.47	16.20	Nil	1	Barnard
	C.T.	Nieuport	F-CGTE	London	Paris	14.00	17.20	Nil	Nil	Hanin
	A.T. & T.	DH9	G-EAQL	London	Paris	17. 10	20.05	Nil	2	Forson
	A.T. & T.	DH9	G-EAGY	London	Paris	17.35	20.25	Nil	2	Tebbitt
	A.T. & T.	DH16	G-EALU	Paris	London	10.05	12.00	Nil	4	Robbins
	C. des G.E.A.	Goliath	F-GEAB	Paris	London	11.15	14.12	Goods	4	Labouchère
	H.P. & M.A.	Spad	F-CMAW	Paris	London	13.55	15.45	Gd's&M	2	Bourdon
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	13.07	17 53	Mail	1	Holmes
	A.T. & T.	DH9	G-EAGX	Paris	London	16 30	18.35	Nil	1	Bradley
	A.T. & T.	DH16	G-EAQS	Paris	London	16.35	18.20	Nil	4	Baylis
July 9th	A.T. & T.	DH16	G-EALU	London	Paris	09.40	12.50	Gd's&M	1	Robbins
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10 03	12.42	Goods	Nil	Holmes
	C. des G.E.A.	Goliath	F-GEAC	London	Paris	10.50	14.20	Goods	Nil	Labouchère
	H.P. & M.A.	Spad	F-CMAW	London	Paris	12.30	13.45	Goods	Nil	Bourdon
	A.T. & T.	DH9	G-EAGX	London	Paris	14.17	16.40	Goods	Nil	Bradley
	A T. & T.	DH16	G-EAPM	London	Paris	17 42	19 53	Mail	Nil	Baylis
	C.T.	Nieuport	F-CGTA	London	Paris	17.43	20.00	Nil	Nil	Lasne
	A.T. & T.	DH9	G-EAGY	Paris	London	10.00	12 56	Nil	1	Lines
	A.T. & T	DH16	G-EAPM	Paris	London	12.05	14 45	Goods	Nil	Powell
	C.T.	Nieuport	F-CGTA	Paris	London	12 15	15.47	Mail	Nil	Lasne
	I.A.L.	DH4a	G-EAMU	Paris	London	12.25	15.51	Goods	1	Barnard
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15 00	18 25	Goods	Nil	Armstrong
	A.T. & T.	DH16	G-EALU	Paris	London	16.45	19.20	Nil	4	Tebbitt
	A.T. & T.	DH9	G-EAGX	Paris	London	17 25	20.15	Nil	2	Forson
July 10th	A.T. & T.	DH9	G-EAPU	London	Brussels	09 00	11.10	Gds & M	Nil	Forson
	A.T. & T.	DH9	G-EAGX	London	Paris	09 38	12.15	Goods	Nil	Lines
	A.T. & T.	DH16	G-EALM	London	Paris	09.47	12 10	Nil	3	Powell
	A.T. & T.	DH9	G-EAGY	London	Amsterdam	10.10	12.50	Goods	Nil	Armstrong

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No. of Passen-gers.	Pilot
July 10th	C. des G.E.A.	Goliath	F-GEAB	London	Paris	10.37	14 30	Goods	Nil	Favrant
	C.T.	Nieuport	F-CGTU	London	Paris	14.30	—	Goods	Goods	Petit
	A.T. & T.	DH16	G-EAPM	Paris	London	10 15	12.55	Nil	1	Baylis
	A.T. & T.	DH9	G-EAPU	Brussels	London	12.00	14.55	Nil	Nil	Forson
	H.P. & M.A	Breguet	F-CMAB	Paris	London	14 40	17.28	Goods	Nil	Le Men
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	16.23	19.18	Gd's&M	2	Holmes
July 11th	A.T. & T.	DH9	G-EAPU	London	Paris	10.15	12.30	Nil	2	Forson
	A.T. & T.	DH16	G-EAPM	London	Paris	10.20	12.35	Mail	3	Holmes
	A.T. & T.	DH16	G-EALU	London	Paris	10.23	12 25	Nil	3	Tebbitt
	A T. & T.	DH16	G-EALM	Paris	London	—	11 55	Nil	1	Robbins
	A.T & T.	DH9	G-EAGX	Paris	London	—	11.55	Goods	Nil	Bradley

The Air Port of Cricklewood.

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No of Passen-gers.	Pilot.
July 5th	H.P. & M.A.	Hand'y Page	G-EASL	Paris	London	13.15	Landed Lympne bad weather 15.50	Goods	—	
	H.P. & M.A.	Hand'y Page	G-EASH	Paris	London	12.40	—	—	10	
	H.P. & M.A.	Bristol	G-EASV	London	Paris	15.30	18 45	—	—	
July 6th	H.P. & M.A.	DH9 x	G-EATA	London	Amsterdam	16 15	—	Mail	—	
	H.P. & M.A	Hand'y Page	G-EATJ	London	Paris	16.18	—	—	—	
July 7th	H.P. & M.A.	Bristol x	G-EASV	Paris	London	13.00	16.15	—	2	
	H.P. & M.A.	Hand'y Page	G-EASY	London	Brussels	—	18.00	—	—	
	H.P. & M.A.	Hand'y Page	G-EASN	London	Paris	—	18 30	—	—	
July 8th	H.P. & M A.	Hand'y Page	G-EASN	Paris	London	11.10	13.40	Goods	3	
	H P. & M.A.	Hand y Page	G-EASY	Brussels	London	12.00	15.35	—	1	
	H.P. & M.A.	Hand'y Page	G-EATN	London	Paris	12.20	17.20	—	10	
	H.P. & M.A.	Hand'y Page	G-EATJ	Paris	London	14.00	—	Goods	3	
	H.P. & M.A.	Hand'y Page	G-EAPO	London	Paris	15.25	—	—	1	
	H.P. & M.A.	DH9	G-EAUC	Amsterdam	London	—	14 50	—	—	
July 9th	H P. & M.A.	DH9	G-EAUC	London	Brussels	12.17	14.40	—	—	
	H P. & M A.	Hand'y Page	G EATN	Paris	London	12.45	16.45	Goods	6	
	H.P. & M.A.	Hand'y Page	G-EATH	London	Paris	16 45	—	Gd's&M	3	
	H.P. & M.A.	Hand y Page	G-EASZ	Amsterdam	London (via Brussels)	—	16.20	—	—	
July 10th	H P. & M.A.	Hand'y Page	G-EATG	London	Paris	12.15	16 02	Goods	8	
	H.P. & M.A.	Hand'y Page	G-EATJ	London	Paris	12.25	16.02	Goods	6	
	H.P. & M A.	DH9	G-EAUC	Brussels	London	12.05	15.30	—	1	
	H.P. & M.A.	Hand y Page	G-EATA	Amsterdam	London	12.13	16.25	—	2	
J ly 11th	H.P. & M.A.	DH9	G EAUC	L ndon	Amsterdam	17.45	20 26	G'ds&M	—	
	H P & M A.	Hand'y Page	G-EATJ	Paris	London	13 05	16.10	—	2	

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd; H.P. & M.A.—Handley Page and Messageries Aeriennes. I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company, M.W.T.C.—Marconi Wireless Telegraph Company.
Where times are missing it is probably owing to Atmospherics affecting signals.

Inland Flying at Croydon.

July 5th.—A.T.T., Ltd., 1 test Avro.

July 6th.—A.T.T., Ltd., 1 Avro, Winchester, return; 1 test D.H.9.

July 7th.—A.T.T., Ltd., 1 Avro, Penshurst, return.

July 8th.—A.T.T., Ltd., 1 Avro, Penshurst, return.

July 9th.—Nil.

July 10th.—A.T.T., Ltd., 1 joy-ride, Avro; C.T., 1 Nieuport test.

July 11th.—A.T.T., Ltd., 2 joy-rides, Avro; 1 test, Avro. A.T.T, Ltd., 3 tests, D.H.16; I.A.L., 1 test, D.H.4a

The Mail Services.

One hears that a new aerial mail service, in addition to those already in existence, will shortly be opened to Brussels. Arrangements are now being concluded between the P.M.G. and Handley Page Transport, Ltd.

It is worthy of note that whilst a letter to Amsterdam costs only 3d. per ounce, one to Paris costs 2s. 6d. The French Government has been asked to agree to a rate of 3d. per ounce and a favourable reply is expected.—G. D.

Instone Air Line.

The D.H.4a is being used this week to make trips between Manchester and the Isle of Man in connection with the Royal Visit.

Mr. Barnard was married on Saturday at Wallington. The previous evening he gave a dinner at the Trocadero to a few friends. All readers of THE AEROPLANE will offer both to him and to Mrs. Barnard their congratulations and wish them the best of luck in the future.—G. D.

Cricklewood.

STRAP-HANGING

One noticed recently that Handley Page Transport, Ltd., claimed the record for being the first to carry strap-hangers in a commercial machine, which event took place during the Margate beanfeast on July 3rd.

In THE AEROPLANE on May 26th, strap-hanging was reported to have taken place in an Instone Air Line machine, and somebody must have been in the habitual condition of a Tube passenger when the Handley Page V/1500 took up those 40 passengers during the war.

Bournemouth

The Bournemouth Aviation Company are arranging to give passenger flights from Bournemouth to Weymouth and back each week-end. The machines employed will leave the aerodrome at Bournemouth at 10.30 hours each Saturday, proceeding direct to Weymouth. On the return journey the aeroplanes will leave Weymouth at 20.00 hours on the Sunday evening. The return fare is £5. A similar service is run each Wednesday, leaving Bournemouth at 10.30 hours, and Weymouth on the return journey at 20.00 hours. The return fare is also in this case £5.—F.

Brooklands.

A correspondent writes:—

It is expected that immediately after the Olympia Show, which is engaging the attention of the local aircraft firms, some interesting test flights will be made.

The Vickers "Viking" will be probably seen out again, it is said that one or two Sopwith machines may be tried out. The Martinsyde "Semiquaver," after being altered in several respects, will be given speed trials in preparation for the Aerial Derby.

The Martinsyde twin-engined machine, about which one has heard nothing recently except that it is being constructed, will doubtless make an interesting first appearance at Brooklands very soon. Another Martinsyde machine, a small speed 'bus, should also be in the air (as it has been metaphorically for some time) in the near future.

The order for the Vickers "Vimy" commercial machines for China will soon be completed, and these machines are a familiar sight on and around Brooklands. A Martinsyde F.4 was out on July 11th, and flew towards London for about ten minutes, returning low and at a high speed.—J. F. S.

TRANS-ATLANTIC
AND
AUSTRALIA FLIGHTS

R.34
AND
VICKERS-VIMY PLANES
WERE DOPED WITH

CELLULOSE ACETATE DOPE

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A Blizzard-Proof Coat

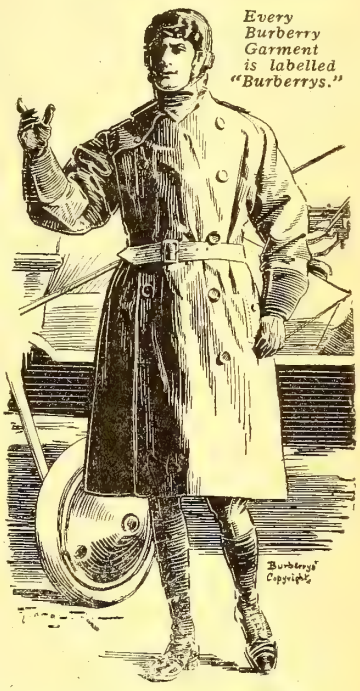
Designed by expert flying men, and made in the Burberry-proofed material worn on the Alcock-Brown Trans-Atlantic flight, The

BURBERRY AIR-WARM

provides a light, yet warm and dependable, defence against rain, mist or wind.

The inside is of luxuriously soft, thick Camel Fleece. The coat is workmanlike in every detail, and has nothing about it to catch in any part of the machinery.

Its two parts can be worn separately or together—the outside alone, providing a Weatherproof that excludes wet or wind without rubber or other air-tight material; the Fleece lining, a smart coat of the British Warm type; whilst the two together, supply a staunch safeguard in which the airman can face the wildest weather with the assurance that his health and comfort are amply protected.



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in Bad Weather.

Kent's Centrifugal CLEAR VIEW SCREEN maintains a clear look-out in spite of rain or snow, or even oil thrown from the engine or tractor.

Made in two types for aircraft purposes :—

(1) Driven by a small propeller carried on one of the struts.

(2) As illustrated driven by vanes fixed round the periphery of the disc.

For a demonstration of the efficiency of the "C.V.S." visit

STAND No. 1,
Aero Exhibition, Olympia,
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YOU WILL BE INTERESTED.

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Works = = = = = Luton.

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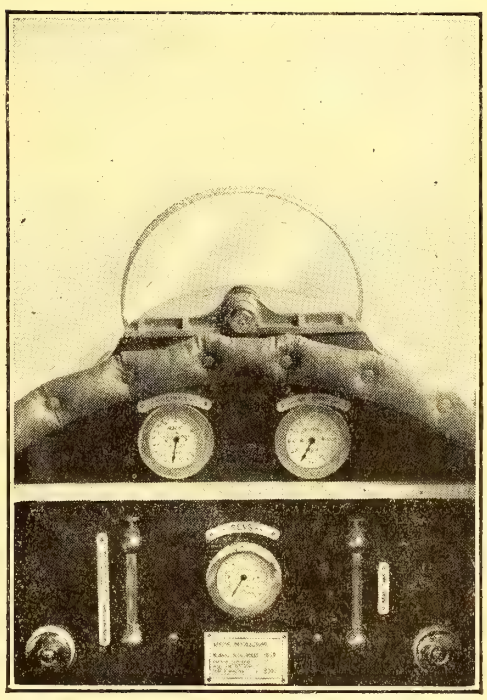

Guildford.

A correspondent writes :—

The Martinsyde Recreation Club are holding their annual athletic meeting on the Guildford Sports Ground on Saturday afternoon, July 17th. Owing to various restrictions placed on the use of the Woking Recreation Ground by the local urban district council, Martinsyde, Ltd., secured the Guildford ground. Many well-known athletes are competing, including the Princeton University (U.S.A.) team. The Martinsyde Pierrot Troupe and Orchestra will give entertainments during the afternoon and evening. Mr. F. H. Campkin and Mr. A. Lovegrove are the hon. secretaries.—J. F. S.

Ipswich.

The Anderson-Pool Aviation Company, about which I have little information, began a flying season at Ipswich on July 2nd. The machine in use is a three-seated Avro, piloted by Captain Anderson (who during the war was stationed at Elmswell in a night-flying squadron). He flew the machine to Ipswich from Manchester in June in two and a half hours.

The flying ground in use is on Priory Heath, and the charges for passenger flights are 15s. 6d. or 30s. a head, according to length.

Martlesham.

MR. TAIT-COX' RECORDS.

One hears unofficially that Mr. Tait-Cox has already improved on his own record of 166.7 m.p.h. It appears that this machine should stand an excellent chance in the Aerial Derby, and if it is purely a matter of piloting, as the similarity in speed of the rival machines indicates it will be, the Nieuport should give a good account of itself.—G. D.

Weymouth.

The Bournemouth Aviation Co. intends on Sundays, Wednesdays and Saturdays during July and August to give passenger flights over Weymouth at a charge of one guinea a head.

H. H. F.

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

An Exhibition Pilot in Sydney.

Lieut. A. M. Webb, late of No. 11 Squadron, R.A.F., has arrived in Sydney with a D.H.6 machine which he took with him from England, and which he intends to use for passenger-flying. After some initial difficulty in regard to a suitable ground (Maxot, the only aerodrome near Sydney, being occupied by Avro machines similarly employed), Lieut. Webb obtained permission to use the Victoria racecourse. This ground has the advantage of being very conveniently situated near to the city, and though too small for large machines has ample capacity for a "six."

After a fortnight spent in rigging and testing the machine business was commenced at the end of April. As Mr. Webb's letter bears the date of May 9th only, it is not possible yet to give definite results, but the writer is very optimistic. He is certainly enterprising, much unseen difficulty and expense having to be met between the purchase of the machine here in England and its erection ready for business at the other end of the world. In the process of making the enterprise known, football matches and other similar meetings have been visited by air and leaflets dropped.

It is interesting to note that Lieut. Solomon, who took D.H.6 machines to South Africa, is also an ex-member of No. 11 Squadron.

Two Long-distance Flights.

A Boulton and Paul aeroplane, with a 100-h.p. engine, recently flew from Sydney to Melbourne in 6 hrs 37 mins.

A B.E.2e (100-h.p. engine) is said to have accomplished the first direct flight from Sydney to Brisbane.

INDIA.

The Handley Page Indo-Burmese Transport, Ltd.

The subscription list for the Handley Page Indo-Burmese Transport, Ltd., was opened in India on June 1st, and closed on June 19th. The authorised capital of the company is Rs. 15,000,000, divided into 1,499,850 Ordinary shares of Rs. 10 each, and 1,500 Founder's shares of Rs. 1 each. The offices are at 16, Chowringhee, Calcutta, and the directors are Lieut.-Col. I. A. E. Edwards, C.M.G., R.A.F. (retired), Captain H. R. Clarke, A.F.C. (late R.A.F.), T. E. T. Upton, Esq., solicitor, E. Villiers, Esq. (late R.A.F.), and C. A. Carr, Esq., sharebroker. The first managing director is to be Lieut.-Col. Edwards with Captain Clarke as assistant managing director.

The company was originally incorporated as a private company on Feb. 6th, 1920, with a capital of Rs. 2,000,000. As the Government of India refuse to give mail contracts to firms controlled by any aircraft construction company it has been converted into a public company and the Handley Page interests are to be bought out.

The company is agent for the Aircraft Disposal Company, Ltd., and will sell in the East anything from the stock of that company.

The erection and repair of aircraft will be undertaken and a flying school with residential quarters for the pupils will be opened. The garaging and maintenance of private aircraft are undertaken.

Handley Page, Ltd., are to be paid £60,000 and to be allotted 10,000 Ordinary shares—the first to repay them for the costs of sending the expedition to India which floated the new company, and the latter for the appointment of the new company as agents in India and Burmah of Handley Page, Ltd.

Lieut.-Col. Edwards is to be paid a salary of Rs. 3,000 a month, with 2½ per cent. on the profits of the company, and Captain Clarke is to receive Rs. 1,500 a month.

The company hopes to obtain contracts for mail and transport services from the Government and civil firms.

SOUTH AFRICA.

A correspondent in South Africa writes :—

The *Sunday Times* of Johannesburg recently devoted some very large headlines and much reading matter to an interview with a Captain Kelly (ex-R.A.F.), who stated that he was out, with a backing of £500,000, to arrange aerial transport services in South Africa. To start with lines would be run between Capetown—Johannesburg, Capetown—Durban; Durban—Johannesburg, East London—Johannesburg, Durban—Kimberley. Thirty South African pilots would be engaged and thirty-six hangars erected to start with. Rather a "Locksley Hall" scheme.—IMOGES.

RHODESIA.

A correspondent in South Africa writes :—

Rhodesia has had its first experience of joy-rides, and outside Bulawayo its first sight of an aeroplane. An Avro (110 h.p. Le Rhône) flew up from Johannesburg to Bulawayo, stopping at Zeerust and Francistown *en route*. On its arrival it was christened the "Rhodesia" by the deputy mayor. Being "Show Week" many Rhodesians took a trip.

Visits have so far been made to Gwelo, Gatooma, and Salisbury, at all of which places many people have made trips. The natives have been particularly impressed.

The tour was arranged by Airoad Motors, Ltd., in conjunction with S.A. Aerial Transports, to whom the machine belongs.

A branch of the S.A. Aero Club is being organised with headquarters in Salisbury.—IMOGES.

STRAITS SETTLEMENTS.

In the early part of May Captain R. S. Carroll, A.F.C., late R.A.F., gave several exhibition flights over the Polo Ground at Penang. On May 6th and 7th large numbers of people paid for admission to the ground.

FOREIGN INTELLIGENCE.

ARGENTINA.

The correspondent of THE AEROPLANE in the Argentine writes :—

The Handley Page Contract.

The Handley Page Company, who are developing their activity in this country, have signed with the Government of Brazil a contract to transport correspondence between the capital of that country and San Pablo at a speed of not less than 120 km. an hour.

Another Accident to Captain Holland.

It is regretted that Captain Holland—late of No. 9 Squadron—has met with another slight accident. On Empire Day, while flying over Tucuman, carrying passengers, his engine cut out and he only had sufficient height to glide to an open space, where, unfortunately, he struck some trees. His injuries are not severe and he hopes to be flying again soon.

A Presentation to an Argentine Pilot.

The following shows that aviators here are honoured in their own country :—The Army and Navy Club yesterday presented to Captain Almonacid a gold medal and a diploma, commemorating his flight over the Andes at night. Colonel George Reyes said a few suitable words. Captain Almonacid replied, visibly moved, being at the end of his speech greatly applauded. Several high civil and army officials were present. The band of the third regiment of infantry played national airs.—DUMSPIRAL.

BELGIUM.

A New Aerodrome at Ostend.

The Communal Council of Ostend has voted a sum of 267,000 francs (normally £16,280) towards the construction of an aerodrome at Ostend. The total cost will be 1,000,000 francs (normally £40,000), and the money voted by the Council will be spent in the purchase of land (which will remain the property of the town).

FRANCE.

Aerial Traffic Figures, Jan.-March, 1920.

The following figures give some details of the traffic of the three principal French aerial lines during January, February and March of this year :—

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Paris-London service : 76 journeys, 30,350 km. (18,800 miles, approximately), 41 passengers, 2,160 kg. of merchandise, 33 kg. of letters.

Paris-Toulouse-Rabat service : 47 journeys, 84,740 km. (52,500 miles approximately), 40 passengers, 432 kg. of merchandise, 100 kg. of letters.

Toulouse-Bordeaux service : 62 journeys, 15,640 km. (about 9,700 miles), 20 passengers.

Total for the three months : 185 journeys, 130,730 km. (about 81,100 miles), 101 passengers, 2,592 kg. of merchandise and 133 kg. of letters.

The Bleriot Security Prize.

The following are the conditions regulating the prize of 100,000 francs offered by M. Louis Blériot for an aeronautical competition to be arranged by the Aéro Club de France :—

The Prix de Securité Blériot of 100,000 francs (normally £4,000) is divided into an eliminatory test and a classification test.

In the eliminatory test all entrants must fly round a closed circuit of 300 km. (about 186 miles) without landing, with a useful load of merchandise weighing at least 100 kg. (about 220 lb.), at a mean speed of at least 140 km. (about 87 miles). The height of 4,000 m. (about 12,300 ft.) must be attained.

In the classification test the aeroplane must be taken to a height of at least 500 m. (about 1,600 ft.), the engine or engines must then be stopped and, the pilot being allowed to reduce his speed by any means he wishes to use, must be landed in a circle 50 m. (about 160 ft.) in diameter, surrounded by an assumed fence (represented by a cord suspended between posts) sixteen feet in height.

The prize, which is open to competition until May 31st, 1925, will be awarded to the first entrant who, fulfilling the above conditions, reduces his speed of descent, from the height of 500 m., to a rate equal to or less than 2½ m. a second.

If the prize is not won on these terms it will be awarded to the aviator who, before May 31st, 1925, has attained the lowest speed of descent from 500 m., provided it is less than 3½ m. a second.

The Aéro Club de France will give all necessary information as to the prize.

A Consultative Technical Committee.

The Under Secretary of State for Aeronautics, M. P. E. Flandin, has formed a Consultative Technical Committee to work with the Service Technique de l'Aeronautique. It is to co-ordinate the diverse efforts of savants, engineers and constructors in theoretic and applied aeronautics.

Its members are as follows :—Aeronautical scientists, MM. Rateau, Marchis, Cacquot, and G. Eiffel. Members selected by the Chambre Syndicate des Industries Aeronautiques, MM. A. Leblanc, Delage, Maurice Mallet, P. Clerget. Members selected by the Aéro Club de France, MM. Rodolphe Soreau, Louis Capazza. Naval Chief Engineer Fortant, director of the S. T. Aé., will direct the work of the Committee, assisted by Commandant Robert, Chief of the Research Section, and by Captain Cammerman, Chief of the 2nd Bureau of the Under Secretariat of State.

The first meeting was held on April 30th last.

The Return of Maneyrol.

M. Maneyrol, who started for Rome on June 29th, returned to Villacoublay on July 7th.

The Coupe Michelin.

The Aviation Commission of the Aéro Club de France has approved the conditions of the Coupe Michelin for 1921. It will take the form of a "Tour de France," in which there will be fifteen compulsory landings. Entrants must complete the course at a "commercial" speed of at least 75 kilometres an hour (about 46½ miles an hour). The winner of the last prize of 20,000 francs will be the entrant who completes the course before Jan. 1st, 1921, at the highest "commercial" speed per hour.

Commercial Aviation in the Colonies.

In the budget of the Minister of the Colonies recently voted in the Chamber of Deputies, a sum of 1,800,000 francs has been set aside for commercial aeronautics in the Colonies.

Insignia on Aircraft.

It has been officially decided in France that civil aircraft are not entitled to use the tri-coloured cockade. Proprietors of aircraft whose machines still bear this insignia have been given until August 1st to alter it. After that date action will be taken against any aircraft bearing tri-coloured badges.

The Gordon Bennett Cup.

The Aero Club of America has offered the following prizes in the Gordon Bennett Cup race. First prize, 12,000 francs (normally £480); second prize, 8,400 francs (normally, £336); third prize, 6,000 francs (normally £240); fourth prize, 3,600 francs (normally £144); fifth prize, 2,400 francs (normally £96); and sixth prize, 1,200 francs (normally £48).

FINLAND.

The Efforts of French Aviators.

Commandant Etienne, formerly in command of the French Aviation Mission in Finland, has now returned to that country accompanied by the aviators MM. Géraud and Furtel, who also were one-time members of the Mission. They intend to open and operate aerial routes between the ports of Finland, Sweden and Esthonia. The machines used will be G.4s, fitted, in accordance with the work to be done, with wheels, floats, or skis.

GREECE.

Commercial Aviation.

The following extract is made from a "Report on the Commercial and Industrial Situation of Greece for the Year 1919, by Mr. E. C. D. Rawlins, Commercial Secretary to H.B.M. Legation, Athens," published as a White Paper [Cmd. 793] during the past week :—

"*Commercial Aviation.*—It is understood that the Greek Government have for some time past been considering the question of commercial aviation in Greece, and that their policy is to encourage the development of commercial aerial routes between Athens and Brindisi in connection with the main trunk aerial route from London to Paris, Paris-Rome, Rome-Brindisi, and services from Athens to Salonica-Constantinople, and Athens-Suda Bay-Alexandria in the other direction. The object of these routes would be mail and passenger carrying services.

"There is an excellent aerodrome about 8 miles N.N.E. of Athens, called Tatoi Aerodrome, which is at present in the occupation of the Greek Naval Air Service. There is also a military aerodrome at Goudi, on the outskirts of Athens, and a further military aerodrome at Eleusis.

"In connection with the proposed services Brindisi-Athens, owing to the frequent storms which occur during the winter months on the West Coast of Greece, it would be necessary to provide frequent aerodromes on the way for purposes of sheltering during storms, re-fuelling, etc. The first of these would probably be in Corfu, where the only suitable site for an aerodrome is near Corfu town, on the marsh opposite the Isle of Ulysses. Patras, owing to its commercial importance, would probably be a further station on the route. There are no aerodromes suitable for large or fast machines in the vicinity of Patras, but large tracts of land exist, at present used as vineyards, which could be converted into aerodromes. Between Patras and Athens there is no known place suitable for an aerodrome. It is understood that the Greek Ministry of Communications is considering propositions from interested firms with regard to carrying out the proposed aerial routes mentioned above."

HOLLAND.

It is reported that an aeroplane belonging to the aerial postal service between London and Amsterdam crashed near Rotterdam, on July 6th at 19.00, owing to engine trouble. This appears to have been a machine belonging to A. T. & T., Ltd.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

The Paris-Rome-Paris Flight.

The failure to reach home on the return journey of his Paris-Rome and back flight, and forced landing near Vercelli between Novara and Turin, is all that the local Press has to say on the Maneyrol attempt. It is strange how unfortunate this flight has been, Capt. Palli and Vedrines owing their deaths to it, and there having been so many failures to get through to programme. Maneyrol's machine was sent back to Turin for the small repairs found necessary. The date was June 30th, 1920.

Another Fatal Accident.

About that date there occurred a Caproni disaster at Malpensa. Two Service men testing a 450 Caproni crashed from an error of judgment at a low altitude and were killed.

The Taliedo Trials.

To enliven the proceedings on the day before the holding of the official trials of the small touring machine competition at Taliedo the airship F.6 left for a round trip over Como, Menaggio, Lecco and back. When passing here she was navigating very low and slowly, possibly in order to allow the 40 persons on board to smell the rose-perfumed gardens for which the district is noted. The weather was most unfavourable for aerial travel. The same, if not worse, was the case on the following day, so that although only four machines were ready for the first day's proceedings, some part of these were deferred till the following day. The Bergonzi canard, the Gabardini and the Sarri failed to appear. Only the preliminary results are as yet to hand.

The Gordon Bennett Race Entries.

It seems certain that the Marchetti Vickers biplane is to fly for the Gordon Bennett race, piloted as usual by Serjt. Liut. Mention of the F.I.A.T., B.R., in this connection is being made.

Aerial Propaganda.

The new propaganda society called the P.A.N., under the management of Ing. Xilo, is going strong. Three hangars and half-a-dozen tractor biplanes comprise the present stock-

in-trade, which one hopes to hear augmented in the near future. The Company's centre is Centocelle, Rome.

The Suppression of the Lake Garda Meeting.

The suppression of the Lake Garda Meeting is announced. The cause is said to be the transport difficulties. It is certainly not due to political motives, as the flying restrictions have been revoked.

The General Directorate of Civil Aviation has been suppressed owing, it is said, to the waste of money made by the Department, which is now merged into or aggregated to the Ministry of War.

Internal Aerial Transport.

Considerable activity is reported from Taliedo and Arcore camps in the way of useful passenger transport to neighbouring cities, helped on by the now chronic transport strikes. Samls and Bréguets are being employed by the civilian people, the military sticking to their SVAs, of which the three- and five-passenger types should shortly be flying. Great electrical weather disturbances are reported as interfering to a large extent with private flying folk's doings, projected and in performance.

A Macchi Flight.

A few days back Sig. Zanetti, Messrs. Macchi's well-known pilot, flew over here from Lake Varese on a L.3 with I.F. six-cylinder engine, a passenger, and an English fox terrier (very much anointed with oil) to have a chat. After the same, with refreshments for men and beast, during which Zanetti told me that Messrs. Macchi had entered for the Schneider Cup—what, he did not divulge—the trio leapt into the air after a lightning take-off to return to Varese—really the only safe way to get back there in these days of strikers in arms.

The Cancellation of Polish Orders.

A report has been going about, and been printed even, according to which Poland has cancelled her large orders for SVA and other Ansaldo-built aeroplanes owing to the delay caused by the transport difficulties in the delivery of the machines. One hopes, and it seems probable, that the tale is merely an exaggeration, and that the change in Poland's military tactics may be responsible for her needing less aeroplanes.—T. S. H.

JAPAN.

The correspondent of THE AEROPLANE in Japan writes :—

A Japanese-built Engine.

A certain civilian manufacturer built a 100-h.p. Japanese Daimler engine according to the specifications of our Government, and they received a success on the test of 50 hours, at the Tokio Ordnance Manufacturing Dept.

A New Flying Contest.

The Imperial Aerial Society announced some time ago that the second mail flying contest between Osaka and Nagasaki will be held during November of this year.—N. K.

SWEDEN.

Flying in Fog.

On July 10th Captain Saunders and Major Orde Lees, of the P.O. Flygkompanie, flew from Sweden to Visby, in the island of Gotland. The distance is about 60 miles, and the flight across the Baltic was made in a thick fog.

SPAIN.

Three Aerial Mail Services.

H.M. the King of Spain recently signed a decree establishing three new aerial mail services. These are to run between Seville and Larache (Morocco); Barcelona and Palma (Morocco); and Malaga and Melilla (Morocco).

UNITED STATES OF AMERICA.

Possible Entrants to the Gordon-Bennett Race.

Mr. W. W. Christmas, of the Cantilever Aero Co., New York, is building two "Bullets" for the Gordon-Bennett Aeroplane Race, to be fitted with 200-h.p. Hall-Scott engines. It is to be hoped that they will stay put, as his other two experimental "Bullets," of which so much was expected, broke up in the air killing the pilots.

The Dayton Flying Field will also have a racing machine in the race with a speed, it is hoped, of 190 m.p.h.

The World's Height Record.

The F.A.I., at the request of the Aero Club of America, has homologated as a world's height record the flight made by Major R. W. Schroeder on a Lepère biplane (400-h.p. Liberty), at Dayton, Ohio, on Feb. 27th, 1920. The height attained was 10,093 metres (about 32,800 feet). The record was held previously by Casale with a height of 9,520 metres.

The Lepère biplane was designed by a Frenchman who, during the war, assisted Commandant Dorand at the Section Technique de l'Aeronautique, and later went to the United States.

A New Transport Company.

During this month the Aerial Transport Corporation will, it is stated, begin operations over a new aerial freight transport system in the United States of America. Five hundred British aeroplanes (mostly D.H.9a and 10) will be used on these services. The eastern terminus of the lines will be in New Jersey, where a large tract of land has been purchased. The first services will be run between New York, Cleveland, Chicago, and Minneapolis.

An allied company, the Aircraft Sales Corporation, has also been formed (in Delaware) to undertake the sale of 2,500 British aeroplanes, 5,000 engines, and much aircraft material.

Among the officials of the two companies are Commander P. N. L. Bellinger, U.S.N. (the pilot of N.C.1 in the trans-Atlantic flight), Colonel A. S. Hartz, Major A. W. Harris (late U.S. Army), and John A. Jordan (chief of construction, U.S. Aerial Mail Service). Judge Grey, Niagara Falls, is head of both firms.

Both these firms would appear to have some connection with Handley Page, Ltd., and the Aircraft Disposal Company, as the above information has been circulated in the U.S.A. by Mr. W. H. Workman, representative in that country of Handley Page, Ltd.

An Airship and Cotton Growing

For the first time in history, cotton growing will be supervised from the air when within the next four months a small airship will be used for this purpose on the 28,000 acre plantation of the Goodyear Tyre and Rubber Company at Goodyear and Litchfield, near Phœnix, Arizona.

At present mounted overseers are employed, but the company has been obliged to use more modern means by the acquisition of many thousand more acres of desert, which will be irrigated to grow long staple cotton used in fabric for the manufacture of automobile tyres.

Besides its use for purposes of supervision, the airship will probably be used to transport Goodyear officials to Phœnix and even as far as the Californian factory at Los Angeles, a trip of about 400 miles. For these purposes the "Pony Blimp" type of airship will be used because of its ease in handling and small crew requirements.

Built as the first airship used in this country for commercial purposes, this little vessel, probably the smallest practicable airship ever constructed, is now being manufactured at the Company's shops in Akron, Ohio. Completion is expected within four months, after which the ship will be sent to Arizona and used for inspection and supervision of the immense cotton plantation of the country in the midst of the desert.

It is 95 ft. long, 28 ft. high, and 40 ft. in diameter, with 35,000 cubic ft. capacity. It will be able to make a speed of 40 miles an hour over the plantation, and will have a range of 400 miles at cruising speed. The pilot and overseer will be able to cover the plantation easily in a short time and can make landings at any point where attention is required.

Company officials believe that the use of an airship for purposes of supervision on the cotton plantation will show that this commercial use of dirigibles can be extended to wheat-field survey and similar purposes.

THE BALLOON APRON INVENTIONS.

On July 12th the Inventions Commission heard five claims in regard to the balloon apron system of anti-aircraft defence. Colonel E. B. Ashmore, C.B., C.M.G., M.V.O., Commander Vittorio Betteloni, Royal Italian Navy (Reserve), Mr. Edgar Booth, Mr. J. H. C. Iggulden, and Mr. Robert Lowry were the claimants.

Mr. Trevor Watson, who appeared for the Treasury, gave an amazingly inaccurate account of the inception and use of balloon aprons. He said that the first general idea was suggested by Mr. Iggulden in a letter to the Prime Minister. Commander Betteloni was the inventor of the scheme under which innumerable small spherical balloons arranged in rows and unconnected with each other were used in the defence of Venice in and after 1916. His scheme was examined in London in July, 1917, but was not adopted. Colonel (then Major-General) Ashmore, G.O.C. London Air Defence Area, suggested the employment of an apron consisting of series of balloons of Cacquot type linked together by a cable from which streamers depended. Mr. Trevor Watson, with consistent inaccuracy, said the first balloon apron was installed in January, 1918. In truth, one apron was in operation by the middle of October, 1917, and another in November, 1917. Mr. Watson said he understood nothing had been caught by the apron system.

Commander Betteloni, Mr. Iggulden (in regard to a screen of spherical balloons connected by barbed wire, suggested in February, 1915), Mr. Booth (whose desire, expressed in September, 1915, for an aerial minefield was mercifully left unsatisfied), and Colonel Ashmore (in regard to the scheme actually adopted and suggested by him in September, 1917, to the F.M. C.-in-C. Home Forces) were examined.

The Committee adjourned until July 19th.

AIRCRAFT IN PARLIAMENT

ARMAMENTS (PERMANENT COMMISSION).

On July 5th the UNDER SECRETARY of STATE for FOREIGN AFFAIRS, in the course of a reply to Mr Myers, said that Group Capt. P. R. C. Groves was the Air Representative upon the Permanent Advisory Commission for military, naval and air questions to the League of Nations.

* * *

July 5th.—The following written answer was given :—

POST OFFICE.—PARIS MAILS.

Lieut.-Colonel GUINNESS asked the Postmaster-General whether he can give the average number and total weight of letters which are posted in, or pass through, London daily for Paris or places beyond, carried by the ordinary mail and by the air mail, respectively.

Mr. PEASE : The average daily weight of letters and postcards sent by the ordinary mail from this country to Paris and places in France beyond Paris is 1,700 lb., including about 850 lb for Paris itself. Precise figures of the number of articles are not available, but they are estimated at from 50,000 to 55,000 a day. The number of letter packets sent every weekday by the air mail to Paris averages about 85, and the total weight is from 5 to 6 lb.

* * *

July 6th.—The following oral answers were given :—

CIVIL AVIATION

Mr. CHURCHILL, replying to General Seely for the Lord Privy Seal, said that the Report of Lord Weir's Committee on Civil Aviation was under consideration by the Government, but no decision had been reached.

Mr BILLING (interposing) : Is the right hon. gentleman aware that there is complete stagnation in civil aviation pending a decision on this matter ?

Mr. CHURCHILL : I am not aware that there is complete stagnation. On the contrary, a considerable amount of progress has been made.

ROYAL AIR FORCE.—MARRIED ESTABLISHMENTS.

In reply to Sir W. Joynson-Hicks, Mr. CHURCHILL said that it is almost certain that a married establishment for the R.A.F. will be approved, but it will necessitate, amongst other expenses, a serious increase in the Building Vote. He added that he was engaged in discussion with the Chancellor of the Exchequer and the Secretary of State for India in regard to the matter.

ZEPPELIN L.71.

Replying to Viscount Curzon, who asked if it would be possible for the Zeppelin Airship L.71 to make a cruise over London, Mr. CHURCHILL said : I hope that the public may have opportunities of seeing this airship at some future date, but at the present time a cruise such as that suggested would mean the diversion of men and money from more important work.

MINISTRY OF AIR (TEMPORARY STAFF).

Lieut.-Colonel PARRY asked what are the temporary circumstances which make it necessary to maintain a temporary staff of 2,007 at the Air Ministry; what is the annual cost of this staff; and when is it anticipated that the need for their services will cease.

Mr. CHURCHILL : The figure for this permanent staff corresponding, for the same date, i.e., May 1st, to 2,007 was 757, but it is of course not contemplated, and would not be possible, to reduce the Air Ministry staff to this latter figure, as is apparently suggested in the last part of the question. The reasons why so large a portion of the total staff are at the present time on a temporary basis are as follows :—

(1) The Departments of Civil Aviation, Supply and Research and Works and Buildings have been advisedly engaged on a temporary footing in the first instance. As the eventual requirements and commitments of the Ministry become better defined, the numbers will be reviewed and where necessary reduced.

(2) Messengers, labourers, cleaners and some other similar categories are normally engaged on a temporary basis in all Government Departments.

(3) The Air Ministry is a new Department, and progress in obtaining permanent staff must needs be gradual.

The annual cost of the total temporary staff is about £540,000. The number of the temporary staff is being progressively reduced both by replacement by permanent staff and by discharge without replacement.

* * *

The following written answers were given :—

ROYAL AIR FORCE.—MOTOR-CYCLE AND SIDECAR COMBINATIONS.

Mr. CHURCHILL, replying to Major Breese, said : The number of passenger-carrying motor-cycles and sidecar combinations now on the strength of the Royal Air Force, including those in Ireland, Egypt and Mesopotamia, is 472. In addition, 131 are awaiting dispatch to the Colonies as free gifts, and a further 870 are in course of being handed over to the Disposal Board. Passenger-carrying motor-cycles and sidecar combinations are provided for urgent dispatch work and for use in place of heavier vehicles, the running costs of which are greater.

MUNICIPAL AERODROMES.

Mr. CHURCHILL, in reply to Lt.-Comdr. Kenworthy, said that at present municipalities have no right to acquire or maintain aerodromes, but that the Air Navigation Bill now before Parliament will give that power. Edinburgh and Sheffield have themselves introduced private Bills this session with the object of obtaining the necessary powers, and new sites for aerodromes have been inspected at Liverpool, Chester, Leeds and Bradford.

* * *

July 7th.—The following oral answers were given :—

AEROPLANE FLIGHT, KIEFF.

Lieut.-Comdr. KENWORTHY asked the Secretary of State for War whether General Carton de Wiart obtained possession from the War Office to take part in the demonstration flight to Kieff in a Bristol aeroplane on behalf of a Polish syndicate; and whether it is considered part of General Wiart's duties to take part in demonstrations of this kind.

Mr. CHURCHILL : The answer to both parts of the question is in the negative. There is no objection to a British officer taking an aeroplane flight; in fact, although not forming part of his duties, the interest displayed by General Carton de Wiart in the enterprise appears commendable.

Lieut.-Comdr. KENWORTHY : May I ask whether this flight was not made to advertise this Polish syndicate; is this syndicate a commercial venture, and if that is the case is it not rather improper for a British General to do such a thing ?

Mr. CHURCHILL : No. Consideration of the circumstances has led me to the conclusion I have already conveyed to the hon. and gallant Member.

AIRCRAFT (GERMANY).

Mr. CHURCHILL, in reply to Lieut.-Col. Fremantle, said the manufacture of aircraft by Germany at the present time is stopped. This situation cannot be substantially modified for several months. There will no doubt grow up in time a German aircraft industry. I cannot forecast its development, but as the figure of 47,000 aeroplanes is approximately that of the whole war construction of Germany for five years, it is, to say the least, highly improbable that any such figure could be reached under peace conditions for a great many years to come.

ROYAL NAVAL AIR SERVICE.

Mr. R. YOUNG asked the Secretary of State for Air what was the method adopted to inform commanding officers of the names contained in the promotion lists issued by the Royal Naval Air Service; and whether the promotion lists were equivalent of, and as authoritative as regards ratings, as was the official "Gazette" is regard to officers ?

Mr. CHURCHILL : Promotions of Royal Naval Air Service ratings were promulgated in Royal Naval Air Department Temporary Memoranda, a series of temporary orders circulated to all Royal Naval Air stations. These were regarded as authoritative, and were used in connection with the adjustment of the pay of the ratings concerned. The promotions of officers were published in the "London Gazette" or in the daily lists of appointments circulated by the Admiralty to Naval Commanders-in-Chief, senior Naval officers, etc.

* * *

July 8th.—The following oral answer was given :—

POST OFFICE.—AIR MAIL.

Lieut.-Col. GUINNESS asked the Postmaster-General whether, in view of the fact that only about one letter in every 700 is now carried by the Air Mail to the Continent, he will now reduce the present prohobitive rate of 2s. 2½d. charged for that route.

Mr. ILLINGWORTH : An air mail service from London to Amsterdam has recently been established with a special air free of 3d. per ounce; and, subject to the concurrence of the French Government, I hope to be able shortly to introduce a correspondingly low fee in the service to Paris

* * *

July 9th.—The following written answer was given :—

ROYAL AIR FORCE (DISCHARGE BY PURCHASE).

Mr. WATERSON asked the Secretary of State for Air whether discharge by purchase is applicable to the Royal Air Force Reserve, Class E.

Mr. CHURCHILL : The answer is in the affirmative. Regulations regarding discharge by purchase from the Royal Air Force will shortly be promulgated.

THE ROYAL AERONAUTICAL SOCIETY.

STAND AT OLYMPIA.—A reading and writing room for the use of members is provided during the Aero Show at Olympia on Stands 94 and 95, underneath the Gallery on the left of the Hall from the main entrance, just beyond the Hammersmith Road entrance. A selection of current aircraft periodicals in all languages is available, and the telephone Number : Hammersmith 2130) may be used free of charge by members.

AERO SHOW LECTURES.—At the request of the Air Ministry the following programme of lectures, which will be delivered in the Concert Hall at Olympia at 3.0 p.m., has been arranged during the course of the Aero Show :—

Date.	Title.	Lecturer.
Sat., July 10th.	"Trans-Continental Flying."	Capt. P. D. Acland.
Mon., July 12th.	"Airships of the Future."	Sqdn. Ldr. Pritchard.
Tues., July 13th.	"Kite Balloons."	Mr. Griffith Brewer.
Wed., July 14th.	"How Airmen Find their Way."	Maj. H. E. Wimperis.
Fri., July 16th.	"Flying-Boats."	Capt. D. Nicolson
Mon., July 19th.	"Development and Future Possibilities of Aeroplanes."	Mr. F. M. Green.

JOURNAL.—The July issue of the "Aeronautical Journal," which is on sale to non-members, price 3s. 6d., contains Commander Hunsaker's paper on "Naval Architecture in Aeronautics," including five appendices which were not read at the meeting. These appendices, which will not be published elsewhere, contain a large amount of information which has been specially released for publication by the United States Navy Department, including details of the construction of the N.C. type Transatlantic flying-boats, which have never before been published in any country. The paper constitutes a complete survey of American methods of design of both lighter and heavier than air craft, and is therefore of great importance.

The same issue of the Journal also contains a short paper on Propellers by Dr. H C. Watts. Owing to extreme pressure of space Major Linton Hope's paper will appear in the August issue.

Copies may be purchased at the Society's Stand at Olympia.

EMPIRE TIMBER EXHIBITION.—A number of admission tickets for the Exhibition at the Holland Park Skating Rink, open from this date until July 17th, have been received from the Overseas Trade Department and may be obtained on application to the Secretary.

AIR MINISTRY LIBRARY.—Permission has been obtained from the Air Council for technical members of the Society to use the Air Ministry Library for reference purposes on production of letters of introduction signed by the Secretary of the Society. Any members desiring to avail themselves of this privilege should therefore apply to the Secretary for a formal letter of introduction.

AUTUMN SESSION OF LECTURES, 1920-1921.—The following gentlemen have consented to read papers to the members of the Society at 5.30 p.m. on the first and third Thursdays in each month, from Oct. 7th, 1920, to March 17th, 1921, in the Theatre of the Royal Society of Arts, John Street, Adelphi, W.C. It should be understood that this is only a preliminary announcement, and that details will be given later :—

Subject.	Lecturer.
Civil Aviation	Major-General Sir F. H. Sykes.
Meteorology.	Major Gordon Dobson.
Night-Flying.	Capt. C. Baker.
Possible Developments in Aircraft.	
Engines.	Mr. Ricardo.

The Handley Page Wing.	Mr. Handley Page.
Design of Aeroplane Control Surfaces with special reference to Balancing.	Mr. H. B. Irving.
Ground Engineering.	Wing Comdr. Outram.
The Cost of Air-ton Miles.	Lord Montagu.
The Human Machine in Relation to Flying.	Colonel Flack.
Parachutes.	Major Orde Lees.
Flying-Boat Construction.	Capt. D. Nicolson.

July 9th, 1920. W. LOCKWOOD MARSH, Secretary.

THE ROYAL AERO CLUB.

AERIAL DERBY.

The Aerial Derby will be held at the London Aerodrome, Hendon, on the afternoon of Saturday, July 24th, 1920. Members will be admitted free on presentation of their Membership Cards.

ENTRIES.—The following entries have so far been received:—

A. V. Roe and Co., Ltd. (owner); Capt. H. A. Hammersley, M.C. (pilot); Avro "Baby" (machine); 35-h.p Green (engine).

Bert Hinkler; Bert Hinkler; Avro "Baby"; 35-h.p. Green.

Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.; Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.; Martinsyde "F.4"; 260/275-h.p. "Falcon" Rolls-Royce.

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Lieut.-Col F. K. McClean, Capt. W. L. Jordan, D.S.C, D.F.C.; Sopwith "Snipe"; 200-h.p. B.R.2.

Leth Jensen; Leth Jensen; S.P.A.D. "S.29."; 80-h.p. Le Rhone.

Bristol Aeroplane Co., Ltd.; C. F. Uwins; Bristol "Bullet"; 450-h.p. "Bristol" Jupiter.

LONDON FLYING CLUB.

The Committee of the London Flying Club has very kindly made arrangements for the Members of the Royal Aero Club to be Honorary Members of the London Flying Club on July 24th, 1920.

This Club, which adjoins the Aerodrome at Hendon, affords every facility for luncheon, tea, and dinner.

In the evening there will be a special dinner and dance.

Further particulars will be posted later to members.

PERSONAL NOTICES.

ENGAGEMENT.

BROOME—LERMITTE.—A marriage has been arranged and will take place on August 17th, at Great Horkesley, between Captain Frank Crossley Broome, D.F.C., younger son of Mr. and Mrs. Frank Broome, of Winterbourne, Weybridge, and Nancy Ismay, elder daughter of the late Lieutenant-Colonel Lermitte and Mrs. Lermitte, Woodhouse, Great Horkesley, Colchester

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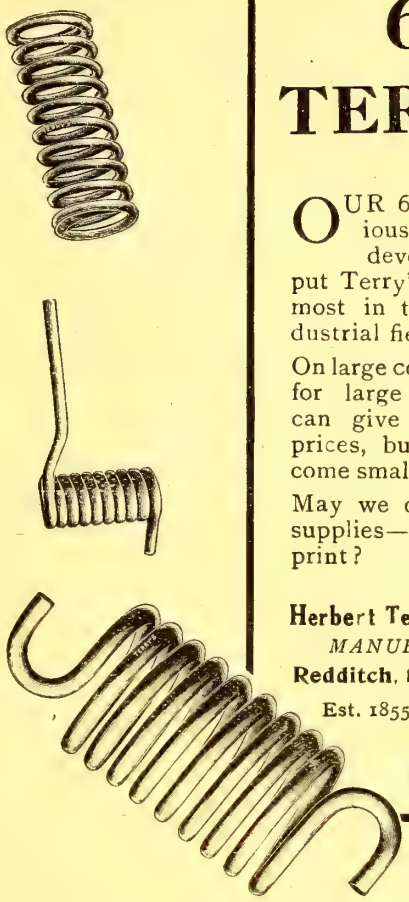

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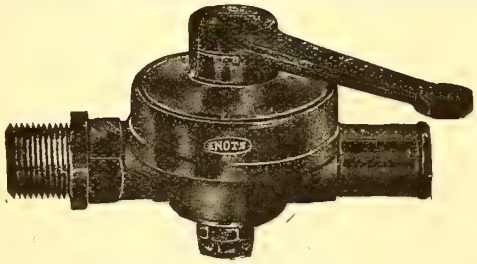

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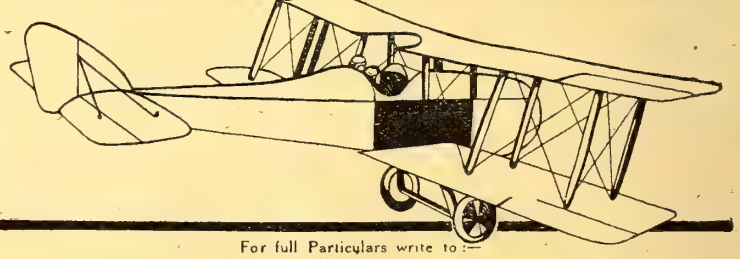

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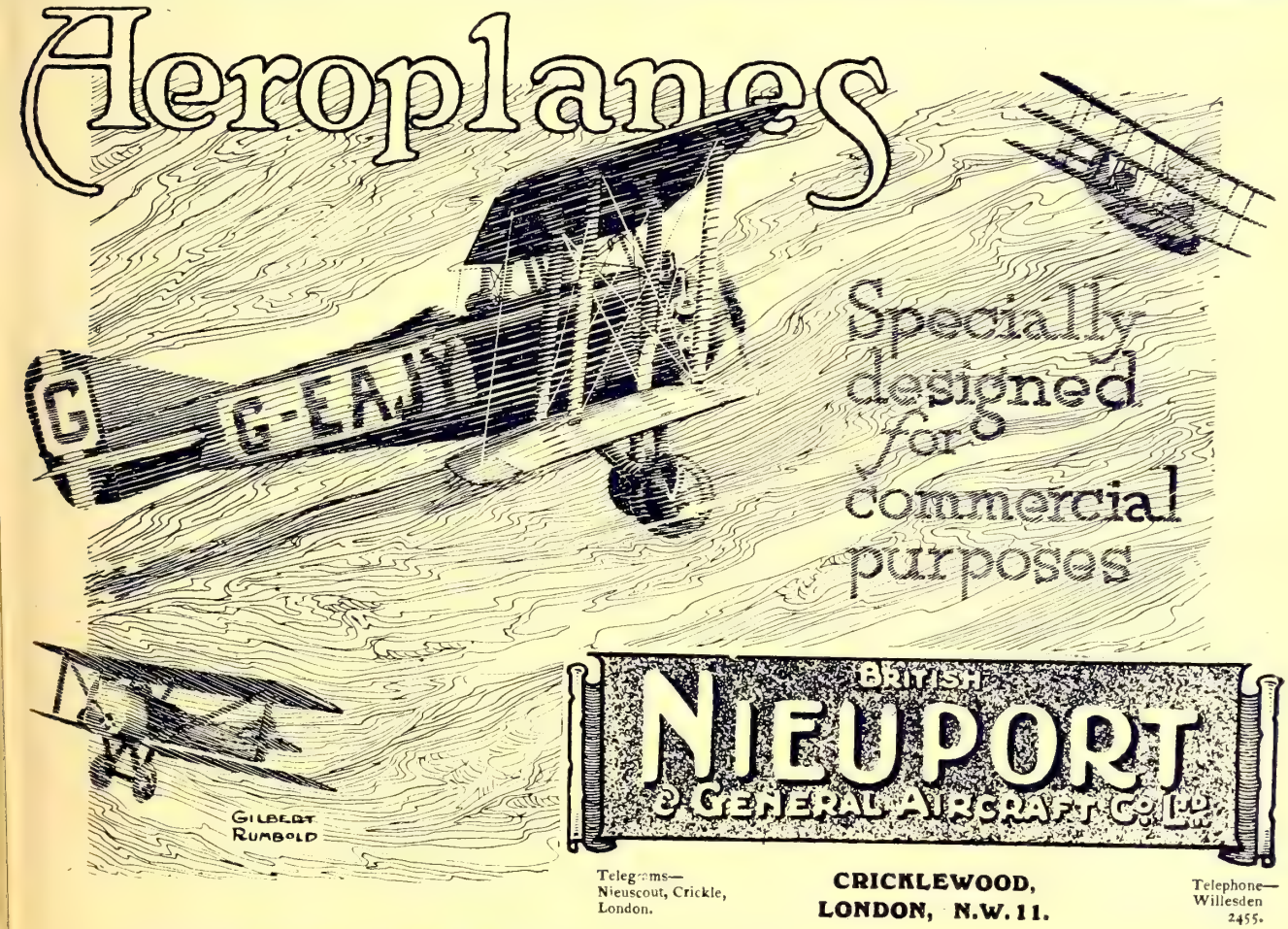

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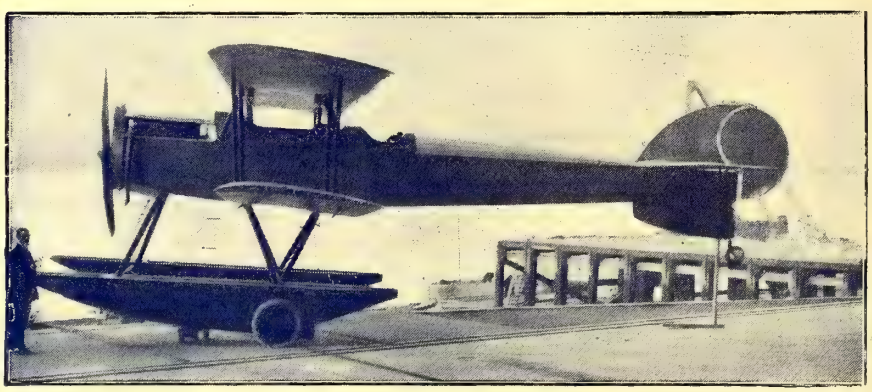

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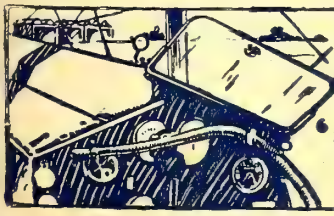

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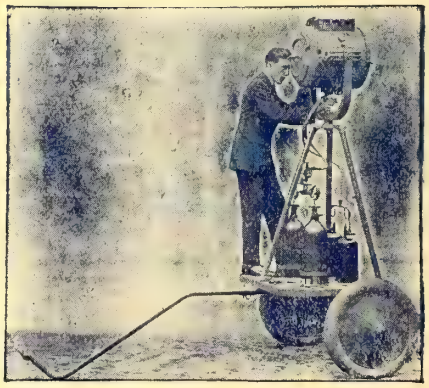

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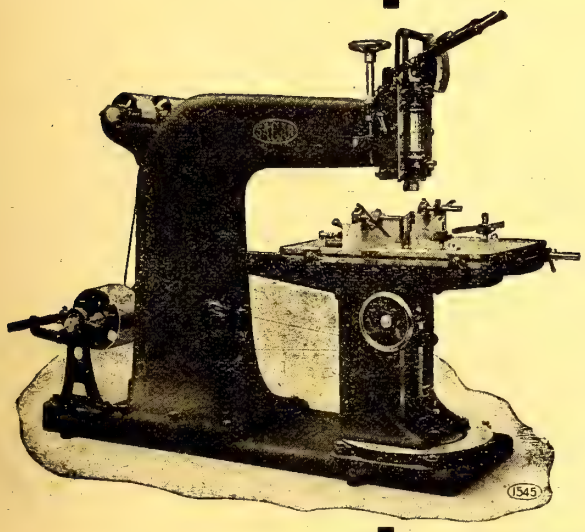

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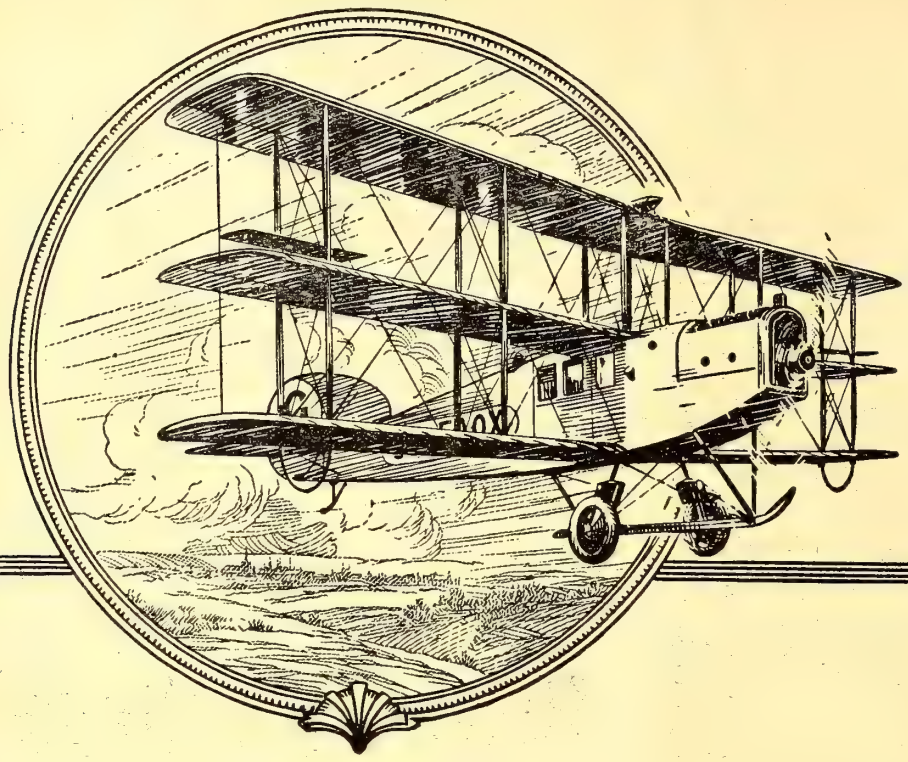

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ON THE AERIAL DERBY.

Last Words on the Aero Show.

Thank Goodness the Aero Show is over and those of us who are concerned with aeroplanes can now turn our attention to practical aviation, such as the Aerial Derby and the Continental Air Lines. Of course the Show was very interesting so far as the exhibits were concerned, and it has done the British Aircraft Industry some good in that it has enhanced the reputation of our constructors. The military and naval and commercial attachés of all countries visited Olympia over and over again. Many of them spent days in the A.I.D. and Technical Department sections studying our methods of inspection, and went away convinced that a machine which is granted an airworthiness certificate after such tests must be worth twice as much as any machine built in any other country. For which impression we must thank Air-Commodore Brooke-Popham and Brig.-General Bagnall-Wild, and their enthusiastic staffs. Also the sheer excellence of the exhibits has convinced our foreign visitors of our pre-eminence in design and construction.

But, one doubts whether any exhibitor of aeroplanes and engines received a single order which would not have arrived in the ordinary course of business if there had not been a show at all. And one is certain that the smaller exhibitors, who might have paid expenses out of their sales to visitors if there had been anything like a crowd have no reason to be pleased with results.

A Successful Failure.

Considered as a Show intended to draw the Great British Public and to interest the people in aviation, the affair was a very complete wash-out. The non-technical newspapers did their best according to their limited intelligence and mental ability, to draw a crowd to Olympia. Some even went to the extreme of publishing really readable and accurate articles on the Show. But the way in which the Show was run successfully kept the public away.

Considered as a failure it was probably the greatest success of the year. As organisers of failure those responsible for the Show displayed real genius.

Any ordinarily silly person could have thought of holding the Show in July, happy in the certainty that nobody except an enthusiast would stew throughout a summer afternoon in that unventilated oven which is Olympia. Any common congenital idiot could have thought of charging half-a-crown for admission so as to keep out impoverished ex-officers of the R.A.F., former workers in the Aircraft Industry, and past and present air mechanics. But it was quite a clever piece of imbecility to close the Show at 21.00 hours so as to make quite sure that people would not come in after their day's work was done.

When one adds to all this the superlatively repellant effect of the posters, and the fact that the issue of free tickets which exhibitors might have used as a bait to draw visitors was absolutely barred, and that even the purchase of tickets which exhibitors might send as invitations to friends was made as difficult as possible, one begins to perceive the transcendental acuteness with which the failure of the Show was assured.

The Mot Juste.

As Mr. Ernest Newman remarked recently, *apropos* an unusually inept stage performance—"In a lifetime I can remember meeting with nothing so utterly brainless. One cannot call it childish; no child *could* exhibit such sheer intellectual vacuity as this." Let that elegant phrase stand as the epitaph of the management of the Aero Show of 1920. It should have been an exemplar to the British Business Community. It was in fact the apotheosis of absolute imbecility.

One can only hope that a very small proportion of the loss will fall on the impoverished Aircraft Industry and that most of it will come out of the hypertrophied profits of the motor-mongers' exhibition in November last. It will be more than a little interesting to see what will happen when the big slump comes in the motor trade and the organisers of the motor shows have to set to work to attract visitors instead of having merely to take the money of a seething mob.

With this mild criticism, which, one hopes, will be taken in the friendly spirit in which it is offered, as indicating a few points which may be improved in the management of the next Aero Show—if there be any Aircraft Industry left to hold a Show next year—let us pass to the more pleasant subject of practical aviation.

Aerial Derby Prospects.

The Aerial Derby takes place next Saturday, July 24th. Even given the best of weather one hardly expects that it will draw the vast crowd which was drawn by the R.A.F. Tournament. But, barring snow or fog, it is certain that there will be a very fine race.

In the first place the Royal Aero Club, which is running the whole affair, has wisely decided to start the machines according to their handicap times, so that the first machine to finish will be the winner of the Handicap Race. Thus the interest will be maintained to the very end, for not till the scratch-man has finished will it be possible to tell who has actually won the Aerial Derby itself.

Under the old arrangement, when a "sealed handicap" was part of the programme, it meant nothing to be first past the post. The crowd had to wait till all sorts of figures were worked out before it knew who had won anything. This year the first men home are the prize-winners in the Handicap, and anybody who notes the starting and finishing times as the machines depart and arrive can tell who has won the Aerial Derby—which amounts to a fastest time prize.

Concerning the Entries.

The entries are quite satisfactory. At the moment of writing there are sixteen of them. They reflect the greatest credit on the good sportsmen who have entered, and, by contrast, they throw into relief the lack of

sportsmanship of a number of people who could very well have afforded to enter machines and did not do so.

For a net expenditure of £100 anybody could have hired a machine from one maker or other, could have insured it and the pilot, and could have come out as a patron of the sport of flying. A man connected with that Aircraft Industry, and knowing how things can be "wangled" could have done it for less. When one considers how many people have made their tens of thousands of pounds out of the Aircraft Industry it is just a trifle disappointing to see how few well-known individuals, as distinct from firms, have come forward as entrants of racing aeroplanes.

Doubtless large household establishments, expensive cars, country estates, and such luxuries do run away with a good deal of money, but one would have thought that a few more people who have done well out of aircraft during the war—for in spite of Colonel Moore-Brabazon's complaint that the Pioneer has been without honour, the Pioneer has not been without profit in his own country—might have risked a hundred pounds or less on a little sporting gamble, or rather, one should say, might have spent it on the best of all forms of propaganda, the encouragement of the Sport of Flying. The more honour, therefore, to those good sportsmen who have entered machines for the races. More especially is honour due to those officers, present and past, of the R.A.F. who have entered machines at their own expense and are flying the machines themselves.

It is a pity that it has not occurred to any R.A.F. units to enter machines. Of course Service machines could not be used for the purpose, but a small subscription from each officer of a squadron or wing or park would easily have covered the hire and insurance of a machine, and the pilot could have been chosen by election or by lot. One offers the suggestion for consideration next year, for one feels sure that competition between units in this way would be good for the R.A.F. as a whole.

Who's Who in the Aerial Derby.

Entries for the Aerial Derby closed on Saturday last, but it is remotely possible that later entries may have been accepted. On such an occasion as this no chance of making a bigger and better show of the race should be lost. At the moment of writing the entries, in order of entering, are as follow :—

1. A. V. Roe and Co., Ltd.—Avro "Baby"—35 h.p. Green engine.—Pilot : Capt. H. A. Hamersley, M.C. (late R.A.F. and R.F.C.).

Captain Hamersley won the Sealed Handicap last year on the original "Baby." He is an exceptionally clever pilot, an Australian, with a fine war record, and will be well worth watching in this year's race.

2. Lieut. Bert Hinkler, D.S.M. (late R.A.F. and R.N.A.S.). —Avro "Baby"—35 h.p. Green engine.—Pilot : Lieut. Bert Hinkler.

Mr. Hinkler is best known as the hero of the recent fine flight to Turin. He is using the same machine and engine in this race. Incidentally it is the same machine and engine on which Captain Hamersley won the Handicap last year. A cross-country pilot of Mr. Hinkler's skill and experience should do well in such a competition as this. His sportsmanship in entering his own machine deserves all praise.

3. Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.—Martinsyde "F.4"—275 h.p. Rolls-Royce "Falcon" engine.—Pilot : Squadron-Leader T. O'B. Hubbard.

As one of the Pioneers of aviation—he was secretary of the Aeronautical Society in 1909, and flew long before the war—Squadron-Leader Hubbard is an instance of the incurable aviator. He flew constantly throughout the war, and commanded squadrons with distinction. He was recently appointed by the Air Ministry to be secretary of the Government Aeroplane Competition which takes place at Martlesham next month. The machine he is flying is that which was a close second in the Aerial Derby last year. Its performance in his skilful hands this year will be watched with interest.

4. Martinsyde, Ltd.—Martinsyde "Semiquaver"—300 h.p. Hispano-Suiza engine.—Pilot : Mr. F. P. Raynham.

This machine, with a bigger fuselage and undercarriage, put up a British speed record of 161 m.p.h. at Martlesham recently. This speed was done with a strong cross wind. Therefore one may assume that its real speed is considerably higher. Mr. Raynham is well known as one of the half-dozen best pilots in the world. Barring engine trouble the actual Aerial Derby seems to be a match between this machine and the Nieuport "L.S.3."

5. The Nieuport and General Aircraft Co., Ltd.—Nieuport "L.S.3"—320 h.p. "Dragonfly" A.B.C. engine.—Pilot : Lieut. L. R. Tait-Cox (late R.F.C.).

This machine, piloted by Mr. Tait-Cox, put up the British speed record to over 166 m.ph. at Martlesham on a calm day. Therefore, as one has remarked, the Aerial Derby seems to be a match between it and the Martinsyde, barring engine trouble.

6. The Nieuport and General Aircraft Co., Ltd.—Nieuport "Nighthawk"—320 h.p. "Dragonfly" A.B.C. engine.—Pilot : Lieut. John Herbert James (late R.F.C.).

This machine should have a speed of between 140 and 150 m.p.h. Mr. James is a skilful pilot, who learned to fly on a Caudron before the war, and he should give a good account of himself in the Handicap, besides being a useful second string for the Derby in case of the breakdown of the superlatively fast machines.

7. Lieut.-Colonel F. K. McClean, A.F.C.—Sopwith "Snipe" —200 h.p. "B.R.2" engine.—Pilot : Capt. W. L. Jordan, D.S.C., D.F.C. (late R.A.F. and R.N.A.S.).

This is a thoroughly sporting entry. Colonel McClean bought and flew Wrights and Shorts at Eastchurch in 1909. He presented the Eastchurch Aerodrome to the Aero Club (not then "Royal"). He lent to the Admiralty the machines on which the first naval aviators were taught to fly (by Mr. G. B. Cockburn). He served with distinction throughout the war. And now we find him, like the true sportsman he is, procuring a Sopwith machine from the Aircraft Disposal Co. and mounting on it one of the best pilots the R.N.A.S. ever had, an officer who is to-day actually in the employ of the Sopwith firm. Thanks to Colonel McClean Captain Jordan will be able to give a very good account of himself in the Handicap, and if the very fast machines fail to get through he ought to go near winning the scratch event.

8. Leth Jensen.—Spad "S.29"—80 h.p. Le Rhône engine.—Pilot : Lieut. Leth Jensen (late Service d'Aviation Militaire).

This also is a thoroughly sporting entry. Mr. Jensen is a Dane who served gallantly throughout the war as a volunteer aviator in the French Army, winning much honour and many decorations. He learned to fly in France some years before the war. As the only foreign entrant all will wish him success in the Handicap, though his low power puts him out of the Derby.

9. The Bristol Aeroplane Co., Ltd.—Bristol "Bullet"—450-h.p. Bristol "Jupiter" engine.—Pilot : Lieut. C. F. Uwins (late R.F.C.).

This is a singularly interesting entry. It is the first public appearance of the latest of the various types of Bristol "Bullet" which Captain Barnwell has designed since his first success in 1913. Also it is the first appearance of the "Jupiter" engine since Mr. Roy Fedden arranged with the enterprising Directors of the Bristol Co. to rescue this highly promising engine from the wreck of the "Cosmos" Co. Admittedly there is further development work to be done on the engine, but one hopes it will make a good show in the race. Mr. Uwins is a singularly able pilot who has flown everything, from "Bullets" to "Pullmans," and he will certainly get the best possible results out of it.

10. A. V. Roe and Co., Ltd.—Avro "Schneider"—240-h.p. Siddeley "Puma" engine.—Pilot : Captain Westgarth Haslam (late R.A.F. and R.F.C.).

This is an excellent effort. The machine is the little seaplane built for the Schneider Cup competition of September last, and now mounted on wheels instead of floats. Captain Haslam is a pre-war aviator who learned to fly in France, and during the war he did excellent work as an instructor and test pilot, besides his war flying. The machine is very fast, probably in the region of 150 m.p.h., and should make a very good show.

11. Lieut. F. S. Cotton.—D H. "14a"—450-h.p. Napier engine. —Pilot : Lieut. F. S. Cotton (late R.A.F. and R.F.C.).

This is another fine sporting effort. Mr. Cotton had this machine built to fly to Cape Town. He crashed in Italy through being directed by the Italian aviation authorities to land on an aerodrome which did not exist. He has now had the machine rebuilt and this is her first public reappearance. She is a huge two-seater built for duration rather than speed, and being of most impressive aspect will add to the interest of the Handicap event.

12. MAJOR-GENERAL J. E. B. SEELY, COLONEL DAVSON, AND SIR J. SHELLEY-ROLLS, BART.—Sopwith "Snipe"—200-h.p. "B.R.2" engine.—Pilot: Flight Lieut. W. H. Longton, D.F.C., A.F.C.

Perhaps this is the most commendable entry of all. The entrants are three of the leading spirits of the Air League. They have joined together to use this best of all forms of propaganda and to show their own belief in aviation. They have procured a machine from the Aircraft Disposal Co., and they have given the mount to Flight Lieut. Longton, whose singularly beautiful flying at the R.A.F. Tournament stamped him at once as one of the most skilful pilots in this country, which is to say in the world. On the merits of the entry and of the pilot the machine deserves to do well, and the skill of the pilot assures its doing so barring accidents.

13. SQUADRON LEADER J. S. D. FALL, D.S.C. (R.A.F and late R.N.A.S.).—Sopwith "Snipe"—200-h.p. "B.R.2" engine.—Pilot: Squadron Leader J. S. D. Fall.

A sporting young officer who has entered at his own expense. Squadron-Leader Fall is a Canadian from British Columbia. He had a highly distinguished career in the R.N.A.S. and later in the R.A.F. At the R.A.F. Tournament he led the "Snipe" formation which gave such an impressive display of combined aerobatic flying. He is much more than a trick-flying pilot, and if his engine behaves he should do very well in the Handicap.

14. MARTINSYDE, LTD.—Martinsyde "F.6"—300-h.p. Hispano-Suiza engine.—Pilot: Lieut. R. H. Nisbet (late R.A.F. and R.F.C.).

Mr. Nisbet was a close second in the Aerial Derby last year and would have been closer still if he had not taken his turns so wide. He is on a faster machine this year, but his mount is not so fast as that of Mr. Raynham or Mr. Tait-Cox or probably of Mr. Uwins. Nevertheless he is probably a good second string to Mr. Raynham.

15. THE SOPWITH AVIATION CO., LTD.—Sopwith "Rainbow"—320-h.p. "Dragonfly" A.B.C. engine.—Pilot: Mr. H. G. Hawker.

This machine, like the Avro "Schneider," was built for the Schneider Cup race last year and is now on wheels instead of floats. Also it has an A.B.C. engine instead of its original "Cosmos" engine. It is quite an unknown quantity, but it is bound to be fast, and may be regarded as the dark horse of the Aerial Derby. If only Mr. Hawker's consistent ill-luck will give him a rest and will permit him to finish the course, he may well be there or thereabouts at the finish.

16. W. G. PUDNEY.—Nieuport "Nighthawk"—320-h.p. "Dragonfly" A.B.C.—Pilot: W. G. Pudney.

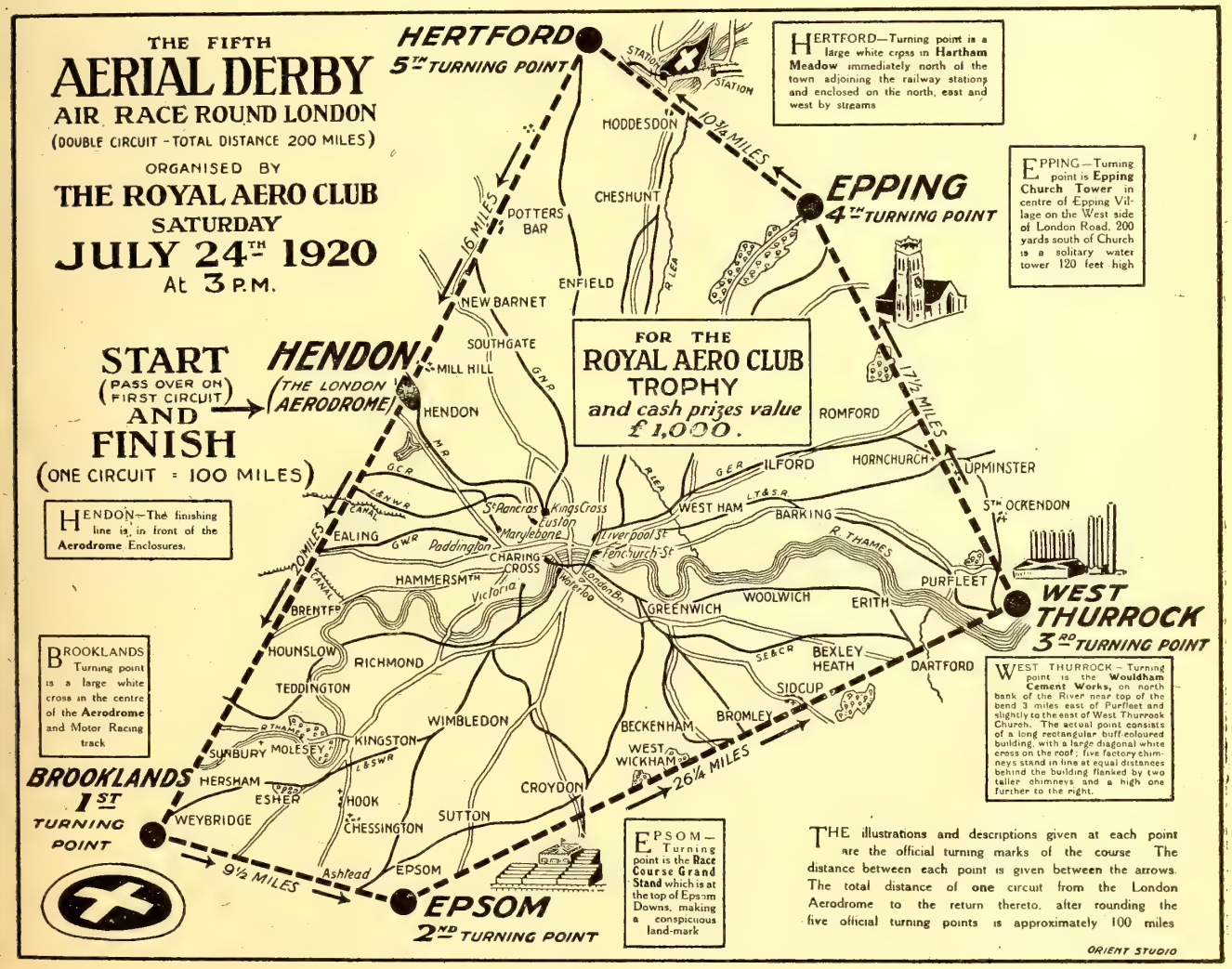
Beyond the fact that Mr. Pudney hails from Cheltenham, one knows nothing of his aeronautical past or personal present. This is a private entry of the pure amateur type, and Mr. Pudney deserves everybody's good wishes for his sportsmanship. One hopes to see him well at the head of the hunt. [This machine was withdrawn on July 20th.—C. G. G.]

The handicap times and racing numbers of the machines will be found under "Royal Aero Club" official notices on page 225B.

A Promising Day.

Altogether there is the promise of a very entertaining afternoon's sport. Moreover, the Royal Aero Club's Committee, profiting by previous mistakes, have secured the assistance of Mr. Bernard Isaac in organising the race. As the right-hand man of the late Richard Gates when Hendon was at the height of its success Mr. Isaac knows most of what there is to know about arranging air races, and his assistance should be of the greatest value to the Royal Aero Club.

It is hoped that all readers of this paper will induce as many as possible of their friends to go to Hendon to see the race, for actual flying of this kind is the best possible method of convincing the doubters that flying is not merely a military affair or a commercial undertaking but a very fine form of sport worthy of the highest traditions of British pluck and skill and nerve.—C. G. G.



SIX MONTHS OF CIVIL AVIATION.—No. III.

GERMANY.

Though civil aviation has made progress, actual flying has been at a minimum owing to a shortage of petrol and the disturbed condition of the country.

There is a Ministry of Air and Transport, controlling air traffic, air regulations, aerodromes, aerial photography, meteorology, etc

Pilots must hold Air Department certificates, and a close check is kept of all flights. Pilots must obtain, unless they are in air transport companies, a police permit for each flight.

Twenty-five transport companies are in existence, none of which are really active at present.

The Government Department for Air and Power Transport (Reichsamt fur Luft und Kraftfahrwesen) has allowed £2,300 (500,000 marks) as a subsidy to German aviation enterprise, conditional on the maintenance of an air post. The Home Office in 1920 have granted £55,800 (12,000,000 marks) for the same purpose.

Germany places great faith in airships. The Bodensee has been lengthened by ten metres and the Nordstern (unmodified Bodensee type) has been completed.

The airship company using the Friedrichshafen-Staaken route, on which the Bodensee successfully operated for three or four months last year, hopes to extend the route to Scandinavia. No flights have been made since November, 1919.

HOLLAND.

Civil aviation is controlled by the Minister of Waterways and Roads. An Air Attache has been appointed to Paris.

The Government has organised a Holland-Java flight, paying the competitors' expenses and giving £900 towards the prize.

It is understood that the Government intends to give a grant to Rotterdam and Amsterdam for the construction of aerodromes.

The opening up of civil aerodromes is at present under the consideration of the Ministries of Navy, War, Waterways and Finance.

The Royal Air Transport Company for the Netherlands has been formed with influential support

"The Netherlands East Indian Government has decided for purposes of meteorological, climatic and other observations, to execute a daily flight between Batavia and Surabaya. This will be carried out during four, not necessarily consecutive, months of the year, and seaplanes and aeroplanes will be employed."

HUNGARY.

Aviation is controlled by a Department of the Ministry of Commerce, manned almost exclusively by demobilised officers. Air regulations are being drafted.

Rumour says that a transport company, the Ungarische Aero-Verkehre Aktiengesellschaft has been formed with a capital of 50,000,000 kr. (£67,000).

ITALY.

The General Directorate of Aviation founded as a Department of the Ministry of Transport on June 30th, 1919, controls civil aviation, and, in addition, the Technical, Supply, and Experimental Departments of Military Aviation. An Under Secretary of State of Air is, it is stated, to be appointed. Air regulations appeared under Royal Decree on Jan. 3rd, 1920.

Sixteen Air Attaches have been appointed and missions have been sent to Japan, Peru, Poland, Serbia, Czecho-Slovakia, Finland, Indo-China and Turkey. The expenditure on these missions may be gauged from the initial costs of the mission to Argentina—£66,000—and its monthly cost, £3,900.

The following air routes are projected or in course of organisation by the State, which will maintain them until private companies are sufficiently prosperous to take over the work :—Turin-Trieste, Nice-Sicily (*via* Genoa, Pisa, Rome, and Naples, with an off-shoot from Rome to Sardinia), Bologna-Brindisi-Otranto, Rome - Ancona, Naples - Foggia, Milan-Genoa, etc.

Several former service aerodromes are now available for civil aviation.

The Italian Government is operating as an experiment a bi-weekly aerial service with Greece, and aerial inter-communication in the Italian colonies is being organsed. The State also proposes to open aviation schools and found university aerial courses at Rome and Turin.

A Sardinian company is said to have received a concession for running a Rome-Sardinia service, a grant of 660,000 lire (£7,300) and the free use of aviation material in Sardinia worth 15,000,000 lire (£166,700).

SPAIN.

A Royal Decree was signed on Nov. 25th, 1919, regulating the flights of foreign aircraft into and in Spain, as an annex to the Air Regulations. A further annex of Dec. 13th, 1919, regulate Spanish Air Customs.

In December last a Department for Aerostatics and Civil Aviation was formed under the Directorate of Commerce in the Ministry of Public Works. A committee for the consideration of aerial matters is now consultative for the new Department.

Aerial postal rates have been fixed. Letters up to 500 grammes in individual rate may be sent. Registered letters cannot be carried.

Technical inspection of air postal services is carried out by an inspector under the Directorate of Posts and Telegraphs.

Mediterranean shipbuilders opened an aerial service between Barcelona and the Balearic Isles on March 18th, 1920. Italian seaplanes are used.

The French Latécoère Company has received an authorisation for a Barcelona-Alicante-Malaga service

SWITZERLAND.

Civil aviation has been transferred to a Bureau of Civil Aviation (opened April 1st) under the Ministry of Posts and Railways. Air navigation regulations were issued on Jan. 27th, 1920.

Customs aerodromes have been opened at La Blècherette (Lausanne) and Dubendorf (near Zürich).

The National Aviatik Company of Dubendorf has taken over the Government air service between Dubendorf, Berne, Lausanne and Geneva.

The Ad Astra Schweizerische Luftverkehrsgesellschaft (Swiss Air Traffic Co.), Zürich, contemplates, it is reported, opening a Geneva-Friedrichshafen service next year. The Société Aéro, Zürich, has, it is said, now amalgamated with Ad Astra.

The Aviar Tourisme S.A., Geneva, has hydro-aeroplane bases at Lugano and Locarno from which passenger trips round the lakes are given.

ASIA.

CHINA.

Italy is endeavouring to obtain Chinese trade. A shipment of Italian aeroplanes arrived at Shanghai in January, 1920, if report be true.

The Anglo-American Tobacco Company is said to intend to use aeroplanes to convey their personnel into the interior.

An American company is reported to have sent seaplanes to Hongkong in January for commercial uses in Chinese waters.

JAPAN.

Little progress has recently been made in Civil Aviation. A special committee is dealing with aviation. The appointment of a permanent Aviation Board of eight Army representatives, four Naval, and fourteen from the Civil Service, is expected.

Two aerial route companies have been formed.

SIAM.

A Royal Decree of Feb. 9th, 1920, ratified the Air Convention. The Minister of War directs air navigation affairs.

The French dominate Siamese aviation. An Italian mission arrived in October, 1919.

The Siamese Flying Corps is said to be organising an aerial post between Bangkok and Uboh.

(*To be continued.*)

AT THE INTERNATIONAL AERO EXHIBITION.

On July 13th H.R.H. the Duke of York, K.G., visited the International Aero Exhibition at Olympia. He was received by Major-Gen. Sir Fredk. Sykes, G.B.E., K.C.B., C.M.G., Controller-General of Civil Aviation, Air Commodore Bagnall-Wild, Director of Aeronautical Inspection, and Mr. H. White-Smith, Chairman of the Society of British Aircraft Constructors. H.H. the Princess Marie Louise and the Rt. Hon. W. Spencer Churchill, Secretary of State for War and Air, visited the exhibition during the afternoon of the same day.

On July 15th H.R.H. The Duke of Connaught visited the exhibition. He was received by Mr. H. White-Smith.

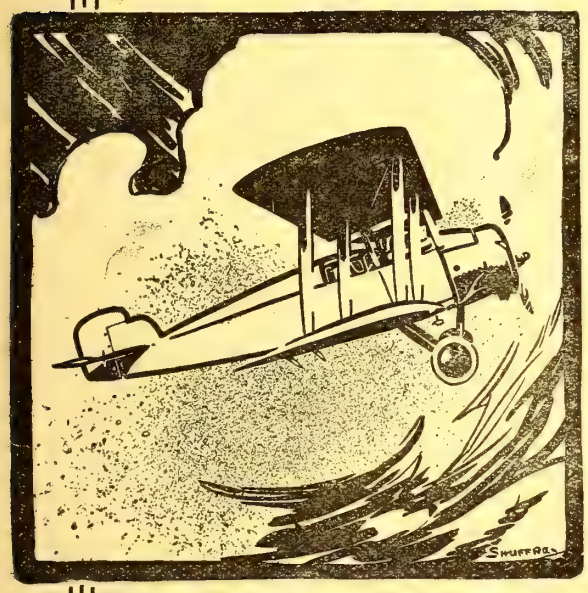
On July 17th Mr. Bonar Law, accompanied by Sir Frederick and Lady Sykes, visited the Exhibition.

The following day H.M. the King of Spain spent an hour and a half at the Exhibition. He showed great interest in the machines on show and, as was to be expected, had considerable knowledge of aeronautics.

THE THREE NEW TYPES OF

SOPWITH

CIVIL AIRCRAFT–



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FURTHER IMPRESSIONS OF THE SHOW.

BY A THOROUGHLY IRRESPONSIBLE CONTRIBUTOR.

The Show towards the close became quite popular. People poured in in their ones and twos per hour. This greatly encouraged "χωρος" with his megaphone in the gallery, who became more and more excited over the cinema every moment.

Latest from Lincoln. The plot thickens. Sundry dissociated but stainless particles of yet another Sopwith machine have come to light on the Firth stand. They are strongly suspected of being part of the 16,278th machine and of belonging to the Czecho-Slovakian list.

Martinsyde, Ltd., have a most excellent line in summer airscrewings, somewhat reminiscent of the Belgian hare. This firm got into very serious trouble with a small boy for building the "Semiquaver," which only flies at 161.7 miles per hour, when they had already built a machine which, as calculated correctly by him, had flown from London to Paris at 175 miles per hour.

As one prophesied last week the "sardine" in the demonstration tank on the Short stand came to a sticky end. Unfortunately, after escaping the horrors of the tin the gallant fish was worsted in an argument with the pump, and his corpse, looking like nothing so much as a submarine kite-balloon, was suddenly disgorged before the eyes of surprised visitors. This is the least painless painless death which was suggested for "χωρος" or the man who made wireless noises.

Formation flying was much in evidence on the Austin stand, also bombing raids on other stands, particularly over one which displayed an aerial photograph of a university called Oxford and not of *The* University. An armistice was sought and the offending photograph removed.

One gathered the following information of the working of "Haireal Tuppeeders" from an expert. It is a very simple process, the carburetter acts inversely on an armature, causing eccentric decarbonisation and producing acute and intermittent backfiring in the aerofoils, and so the gas gets into the nose and away it goes.

One or two people became rather unpopular by trying to induce the Bristol "Pullman" to fly on the same principle as M. Raymond's looping models.

Up in the gallery one liked the strong silent men in the Medical Section's Avro, also Egbert and Terence. Egbert was inclined to be a bit shirty, but then so would anyone who had his nose pinched all day. The enormous Y.M.C.A. building to which reference was previously made, later indulged in some short flights across Pulham aerodrome.

There was a large map up the far end of the gallery, apparently intended to demonstrate the manner in which the Air Ministry communiqués juggle with aeroplanes. One can see an Avro starting from Croydon and as it arrives near Le Bourget gradually assuming the rôle of a Bristol Fighter, while it is also flying back to Cricklewood as a Handley Page.

In the model of Croydon one liked the trees, and one hopes that the C.A.T.O. will at once have similar full-sized trees erected at Waddon.

An attraction was added to the show in the form of a competition to find a catch word for the London-Paris Air Service. The wife of an eminent Air Force Officer, who had had some, suggests "The Quick Frow-up."

No! *That* type of engine was not used in the *Resolute*.—G.D.

An official of the Air Ministry complains that a visitor has adopted as a souvenir of the Show one of the model aeroplanes from the model of Croydon Aerodrome and hopes that the person who was afflicted by this inverted form of reverence will return the model to the Air Ministry.

One who has had some laments that the excellent photograph of an engine overhaul displayed by the photographic section of the Air Ministry is not true to life, in that the man with the sledge-hammer is absent.

The Single Yarn Testing machine in the A.I.D. exhibit caused much interest. One of the chronic critics of Air Ministry methods pointed to it with contempt, and remarked that it was evidence of our inefficient methods, for any sensible person would have test pilots' Combat Reports in batches, a whole patrol at a time, and would not have bothered testing each pilot's report as a single yarn.

Now at last the Show is over and we can all get back to serious work and be as dull as we like.—X. Y. Z.

A GAME OF DRAUGHTS.

According to a report in the *Daily Sketch* of July 15th, a fear is expressed in America that propellers of aeroplanes flying over the Atlantic off Sandy Hook during the contests for the America Cup may interfere with the sailing of the competing boats in light airs, and consequently pilots have been forbidden to fly over the course under a minimum height of 400 ft. It is probable that aviation police will be on the look-out to enforce this regulation.

One wonders how they will do it. It ought to be quite amusing to see plain-clothes aeroplanes trapping poor unfortunates in the sky—but how about their own slipstream? But then, the arms of the Law always were a blameless band, and as they have no police "on their backs to bite 'em," they should be immune. One can imagine a patriotic Yankee "cop" doing spirals round *Shamrock IV* and taking the wind out of her sails.

Incidentally, one now knows why there is a scarcity of straw hats in London and a dearth of fruit in Kent. The London-Paris Air Lines have blown all the hats away, and reduced all the produce of the "Garden of England" to windfalls.

And why blame the cold weather when even the recent frigid atmosphere may be the result of excessive "revving up" on the ground at Croydon and Cricklewood?—L. B.

AIR HOGS.

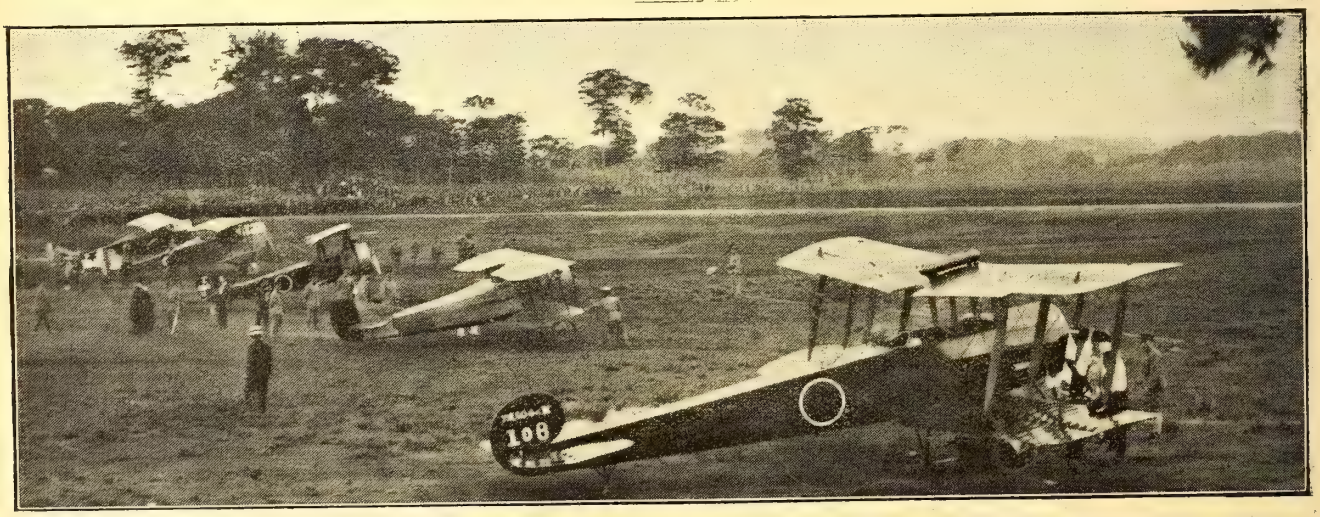
The following letter has been received :—

Sydenham, July 18th, 1920.

Sir,—Whilst listening to a Pastoral play on Saturday at Sydenham, I was much annoyed by an aeroplane flying over the ground and completely ruining a song by the noise of its propellers. I am not able to recognise machines by sight, but I should say from general outlines that this was either one of other of the machines recently illustrated in the *Daily Mail*. Perhaps it was the 200 h p. B.A.T. "Crow" or the new Davidson flying machine.

I cannot help thinking that had the occupants of this machine been gentlemen, they would have steered away from our play when they heard the song going on. Hoping that you will give the notoriety to this letter for which your paper is so renowned.

Yours truly,
(Signed) "DISGUSTED."



Three Japanese military aeroplanes on the Yoyogi Parade Ground at Tokio. Reading from the right, the first three machines are an Avro, a Spad, and a Sopwith.

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P. STIMPSON

THE "ARK ROYAL" AFFAIR.

It should be noted that on July 14th Lieut.-Commander The Hon. Joseph Kenworthy, R.N., M.P., asked the first Lord of the Admiralty in the House of Commons questions concerning the outbreak of typhus on board H.M.S. *Ark Royal*.

These questions and the answers thereto will be found in their proper place in this issue of THE AEROPLANE under the heading "Aircraft in Parliament" on page 225A.

On the same day, July 14th, there appeared in THE AEROPLANE a full and circumstantial account of the causes which led up to this outbreak, and the subsequent Naval proceedings.

One is particularly anxious to emphasise the fact that there is no connection between Lieut.-Commander Kenworthy's questions and the article in THE AEROPLANE. It was merely an unfortunate coincidence. One cannot imagine any other subject on which one would be at all likely to find oneself in agreement with Lieut.-Commander Kenworthy. For his expressed opinions, mental attitude and public actions one has nothing but contempt. It is singularly unfortunate in an age of scandal that one should have selected the same side as Lieut.-Commander Kenworthy on the same scandal at the same time. It is only to be presumed that this is another instance of extremes meeting.—C. G. G.

The following letters on this affair appeared in the *Times* newspaper on July 17th :—

THE "ARK ROYAL" TYPHUS CASES.

Sir,—The First Lord of the Admiralty stated yesterday, in answer to a question in the House of Commons, that the seaplane-carrier *Ark Royal*, having been used for carrying typhus cases in the Black Sea, "was disinfected immediately afterwards," and that a certain number of typhus cases which occurred subsequently among the crew were sent to the General Hospital at Constantinople. The facts covered by this official answer are—if statements recently received from some of the sufferers be correct—that the *Ark Royal*, so far from being "disinfected immediately afterwards," was kept in an infected condition outside a Black Sea port for six days, and that the crew developed typhus from the infectious and lice-ridden condition of their ship. They were then dumped for quarantine on the disused and typhus-infected site of a camp for refugees near Constantinople, which was allocated to them without any previous inspection or sanitary precaution whatsoever; and, after being landed with kit for only three days, were kept there for weeks, developing fresh cases of typhus and one of smallpox. Deaths have resulted. A little more light on this case of official neglect is still needed.

July 15th. (Signed) VERITAS.

Sir,—In to-day's Parliamentary report an answer was given to Lieut.-Commander Kenworthy by the First Lord of the Admiralty, which shows rather defective knowledge of the work our ships have been required to do in the Black Sea. I happen to have correspondence on the point from an officer in *Ark Royal*—the ship referred to in question and answer—and there was scandalous neglect of proper precautions after the work of mercy in evacuating typhus-stricken refugees had been accomplished. The ship was not disinfected immediately, as stated by the First Lord, but was sent in its infectious and verminous condition to evacuate another lot of military refugees (not typhus-infected). After this, typhus broke out, and it was not till then that any steps were taken to cleanse and disinfect the ship. Even then the men of the ship were quarantined in a camp improperly prepared and infected with vermin, and further typhus cases occurred before a healthy camp was allotted to them. One-tenth of the crew contracted typhus. They have to be mute, but their friends and relations are free to protest against the perils and anxieties of war being increased in this way by wanton negligence.

Bristol, July 15th. (Signed) AN ANXIOUS WIFE.

THE "ALULA"—A NEW HIGH-LIFT WING.

Those who are concerned with aerial transport, and more especially those who are believers in high-lift wings as a means towards making aerial transport a commercial proposition, will be glad to hear of yet another new form of wing which tends in the right direction, namely, big lifting capacity for low power.

The wing in question was introduced to the technical public on the last day of the Aero Show, July 20th, by the Commercial Aeroplane Wing Syndicate, Ltd., of 34-36, Gresham Street, E.C.2. Experiments on an actual aeroplane fitted with this wing have been carried out on a machine built by the Blackburn Aeroplane and Motor Co., Ltd., of Leeds, and piloted by Captain Clinch, late R.F.C. The technical results of the experiments have been substantiated by Mr. Mayo, of the firm of Ogilvie and Partners, and the calculations for the experimental machine were made by Mr. Harris Booth, who was one of the first scientists to apply proper academic methods to aerodynamical problems.

The new wing is known as the "Alula," and is the result of some eight or nine years' patient research work on small scale and full scale models, and of the expenditure of some scores of thousands of pounds. All these experiments have been directed towards producing a wing with high lifting power and low head resistance. The experimenters argued that this could only be obtained by discovering a wing which produced over its surface the type of air flow known as "irrotational" or "two dimensional"—*id est*, air flowing along a line which only rises and falls, but does not move sideways in a third dimension.

This type of flow is obviously strictly parallel to the direction of flight, and so it may be assumed that none of the energy imparted to the air is wasted in side movement. The idea is, in effect, the idea of the perfect streamline strut or fuselage applied to the wing itself, in relation to which designers have hitherto been singularly careless in this respect.

It is claimed for the "Alula" wing that it eliminates all "end losses" and leakage which reduce the efficiency of other wings and waste energy in vortices. And thus it is claimed that an enormously high percentage of the power put into the wing by the engine is given back in actual lifting power, which is as it should be in a vehicle dealing with that most elastic of all substances, the air.

As the result of the prolonged experiments already mentioned it is now possible for the experimenters to vary all the features (or factors) of a wing in unison—or perhaps one should rather say, in harmony—so that when it is necessary to vary one dimension of a wing all the other component dimensions may be varied in proportion and pre-ordained results may be obtained. It is of interest to learn that the wing shape produced resembles closely the wings of the most powerful birds, although the experimenters and the Almighty apparently arrived at their similar results by different methods.

The experimental machine, which is a species of parasol monoplane with the wing raised above the slip-stream of the tractor screw, was built at the Brough works of the Blackburn Co. by Major F. A. Bumpus, and the first straight flights were made by Major Veal. Thereafter Mr. Harris Booth and Mr. Copley were entrusted with the design and constructional work. Capt. S. J. Clinch became the regular test pilot, and it is only fair to record that he took up a new and unknown machine after every alteration.

Pilots will be interested to hear that the machine refuses to obey the control of ailerons, and that it is controlled laterally by moving a hinged portion of the leading edge of each wing. This movement controls the direction of the machine as well as its lateral position, so that the rudder is not used in conjunction with the lateral control—which, incidentally, would seem to abolish the Wright patents. Also it is stated that if the slip-stream of a tractor screw is allowed to flow over the wings it entirely spoils their lifting power.

Aircraft manufacturers will be interested also in learning that the Commercial Aeroplane Wing Syndicate do not appear as in any way competitors of the other members of the rest of the Aircraft Industry. They do not propose to build machines, except for experiments, nor do they propose to endeavour to secure a monopoly—unless, of course, other firms refuse to recognise the merits of their discovery. Their intention is rather to co-operate with the Industry and to place their technical staff at the disposal of aircraft designers.

Ordinary aircraft users, whether passengers or despatchers of goods, will be particularly interested to learn that actual designs have been produced by Mr. Harris Booth for a cargo machine to carry four tons. This is known as the "Pelican 4 Ton Lorry." This is a colossal cantilever monoplane designed for two 460 h.p. Napier engines. Its cruising speed is 72 m.p.h., its top speed 96 m.p.h., and its landing speed 55 m.p.h. Its total load is 24,100 lb., its wing loading is 12.9 lb. per sq. ft., its useful load is 4 tons, with fuel for the London-Paris journey, and the cost of operation is 2.6 pence per lb. of cargo for the London-Paris journey.

Here then, it *seems*, we have the beginnings of a new step forward in civil aerial transport.—C. G. G.

MR. GEOFFREY WATSON'S PICTURES.

The exhibition of pictures by Mr. Geoffrey Watson at the Brook Street Art Gallery, which is being held in aid of the Royal Air Force Memorial Fund, will be extended in duration by a week. The closing day will now be Wed., 28th inst.

THE B.A.T. BANTAM.

In the description of this machine last week the speed was given as 146 m.p.h. at 1,000 ft. This should have been 146 m.p.h. at 10,000 ft. The climb was said to be 1,700 ft. in 16 m. 18 s. This should, of course, be 17,000 ft. in 16 m. 18 s.

THE NEW
ROLLS-ROYCE

"THE NEW CAR SIMPLY ENCHANTS ONE!"

THE above statement is taken from a letter which we reproduce in full below. This letter is written by a private owner with a wide experience of pre-war Rolls-Royce Cars, extending over several years. The original letter may be seen at our showrooms. Ref. No. 410.

June 30th, 1920.

"I write to say how very much pleased I am with the new car: it is a great improvement on the old car, and I thought the old one perfection. The new car simply enchants one; the extreme silence, engine flexibility, quick acceleration, and perfect springing cannot be too highly praised; also the self starter, like the car, is perfect.

"The car has now run, since the beginning of the year, 6,640 miles, and her average consumption, in the country 15 miles to the gallon, in the town 12 to 13.

"I have had several experienced motorists out with me for a run in the new car on various occasions, and their unanimous opinion was that the new car is a great improvement on the pre-war cars."

The following firms, who purchase direct from us, have sole selling rights of our cars in their respective districts.

Leicestershire, Derbyshire, Notts., Lincs., Staffs., Worcestershire, Warwickshire, Northants. and Rutlandshire: The Midland Counties Motor Garage Co., Ltd., Granby Street, Leicester. Manchester and District, including East Lancs. (as far north as a line drawn on the map due east from Cockerham) and East Cheshire: Joseph Cockshoot & Co, Ltd., New Bridge Street, Manchester.

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NAVAL AND MILITARY AERONAUTICS.

The R.A.F. Appointments and Gazettes will be found on page 225B.

FROM THE COURT CIRCULAR.

HOLYROOD PALACE, July 5th.

The King held an Investiture in the Forecourt of the Palace at 11 o'clock this morning

The following were severally introduced into the presence of His Majesty, when the King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted :—

THE MOST DISTINGUISHED ORDER OF SAINT MICHAEL AND ST. GEORGE AND THE DISTINGUISHED SERVICE ORDER.—Companion.—Group Capt. Robert Hall, R.A.F.

THE MOST DISTINGUISHED ORDER OF SAINT MICHAEL AND SAINT GEORGE.—Companion.—Group Capt. Robert Gordon, R.A.F.

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—Commander.—Military Division.—Wing Comdr. Richard Pink, R A F.

Officers.—Military Division.—Lieut.-Col. Laurence Strain, R.A.F., and Flight Lt. Oswyn Lywood, R.A.F.

His Majesty then conferred decorations as follows :—

BAR TO THE DISTINGUISHED SERVICE CROSS.—Sqdn. Ldr. Vernon Gaskell Blackburn, R.A.F. (also received the Air Force Cross).

THE MILITARY CROSS AND THE DISTINGUISHED FLYING CROSS AND BAR.—Flying Officer Thomas Williams, R.A.F.

THE DISTINGUISHED FLYING CROSS.—Capt. William Walls, R.A.F.; Lieut. William Grossart, R.A.F.; Observer-Officer Alexander Adams, R.A.F.; and Observer-Officer Frank Foster, R.A.F.

THE AIR FORCE CROSS.—Lieut.-Col. Ernest Auldjo-Jamieson, R.A.F.; Flight Lt. Arthur Gallehawk, R.A.F.; Lieut. John Horne, R.A.F.; Lieut. Cyrus Mortimer, R.F.A., attd. R.A.F.; and Observer-Officer Alfred Rogers, R.A.F.

HOLYROOD PALACE, July 7th.

The following is from the list of presentations at the Reception held by the King and Queen at Holyrood Palace on Tuesday afternoon :—

Officers of the Royal Air Force presented by Air Vice-Marshal Arthur Vyvyan, C.B., D.S.O.—Groves, Flight Lt. William, A.D.C.; Hall, Group Capt. Robert, C.M.G.; Pink, Wing Comdr. Richard, C.B.E.; Ross, Wing Comdr. Robert, D.S.O., A.F.C.; Bromet, Sqdn. Ldr. Geoffrey, D.S.O., O.B.E.; Garrod, Sqdn. Ldr. Alfred, M.C., D.F.C.; Perrin, Flight Lt. Eugene, O.B.E.; Reason, Flight Lt. William; Woollard, Flight Lt. Felix, A.F.C.; Gallehawk, Flight Lt. Arthur, A.F.C.; Williams, Flying Officer Thomas, M.C., D.F.C.

BUCKINGHAM PALACE, July 8th.

The Duke of York, attended by Wing Comdr. Louis Greig, paid a visit of inspection to the Royal Air Force Station, Uxbridge.

His Royal Highness, attended by Capt. the Hon. James Stuart, was present at a Ball which was held at the Ritz Hotel in aid of the Royal Air Force Memorial Fund.

BUCKINGHAM PALACE, July 12th.

The Duke of York, attended by Wing-Commander Louis Greig, was present at a Dinner given to the Survivors of the First Hundred British Pilots and Pioneers of Aviation, at the Connaught Rooms this evening.

BUCKINGHAM PALACE, July 13th.

The Duke of York, attended by Wing Comdr. Louis Greig, visited the International Aero Exhibition at Olympia this morning.

BUCKINGHAM PALACE, July 15th.

The Duke of York, attended by Capt. the Hon. James Stuart, visited an Exhibition of Paintings and Drawings of Aircraft in War and Peace, in aid of the Royal Air Force Memorial Fund, at the Brook Street Art Gallery, to-day.

NAVAL.

ADMIRALTY APPOINTMENTS.

The following appointments have been made :—

July 12th.—Engr. Lieut. Commr.—C. S. Bell, to *Ark Royal*.

July 13th.—Comdr.—R. W. Grubb, to *Ark Royal*, in command, July 12th.

MILITARY.

Fighting in Mesopotamia.

The following is taken from the official summary issued by the War Office on July 16th :—

"The disorder on the Lower Euphrates continues, and has assumed considerable proportions. . . .

"The garrison of Rumeartha is being provisioned by aeroplane, and has also obtained supplies by means of raids into the town, which is held by the tribesmen. Raids against the railway continue to be frequent; two trains have been derailed and one burned. Our aeroplanes have been active in bombing and machine-gunning hostile villages and tribal concentrations."

AIR FORCE.

OFFICIAL COMMUNIQUES.

R.A.F. OFFICERS' WAR MEDALS.

The Secretary of the Air Ministry announced on July 14th that Medal Rolls of those who have qualified for the British War and Victory Medals are in course of preparation.

Demobilised and invalided officers of the Royal Air Force are requested to write to the Secretary (S.7—Medals), Air Ministry, Kingsway, W.C.2, as soon as possible for the necessary form of application in order that their claims may be considered.

Medal Rolls in the case of airmen are being prepared from their documents at the Royal Air Force Record Office and no application on their part is necessary

An Accident at Kenley.

Flying Officer Victor Oliver Reynolds, Royal Air Force, late of the Hampshire Regiment, and Airman Braithwaite were killed in an aeroplane accident at Kenley on Monday, 12th. The machine was a D.H.9a with 410-h.p. "Liberty" engine. Apparently, Flying Officer Reynolds was turning at about 100 ft. and the machine got into some kind of a flat spin. There was not sufficient room for the pilot to get it under control again. On hitting the ground it caught fire and those present dragged the two men away from the flames, but they had unfortunately already been killed by the fall.

Athletics in the R.A.F.

On Saturday, July 17th, the Royal Air Force Athletic Association held a meeting at Queen's Club, West Kensington, to decide the athletic championships in the R.A.F. Below are given the winners of the various events :—

100 Yards.—Serjt.-Major F. Mawby (holder), Uxbridge. Time, 10 3-5 sec.

Putting the Shot.—F. O. Maxwell, Halton, 33 ft. 10 in.

Half-Mile.—Cpl. Still, Halton. Time, 2 min. 7 4-5 sec.

220 Yards.—Serjt.-Major Mawby (holder), Uxbridge. Time, 23 2-5 sec.

High Jump.—Serjt.-Major Miller, Cranwell, 5 ft. 8¾ in.

One Mile.—Flt.-Lieut. H. C. Irwin, Howden. Time, 4 min. 33 4-5 sec.

Quarter-Mile.—F.O. Wakefield, Uxbridge. Time, 52 2-5 sec.

Long Jump.—Serjt.-Major Miller, Cranwell, 20 ft. 7 in.

120 Yards Hurdles.—Serjt-Major Mawby, Uxbridge. Time, 17 sec.

Three Miles.—Flt.-Lieut. H. C. Irwin, Howden. Time, 15 min. 17 2-5 sec.

One Miles Relay Race.—Halton. Time, 3 min. 52 2-5 sec.

The King's Challenge Cup was won by Uxbridge. In the competition Uxbridge and Halton secured the same number of points, 21; but as Uxbridge supplied the greater number of individual winners they won the cup.

The King's Hundred.

In the contest for the King's Prize at Bisley, which was shot for on July 17th, Lieut. J. A. Smith, late R.A.F., was placed 51st and Lieut. E. L. Hopkins, late R.A.F., was placed 67th. Both, therefore, receive the National Rifle Association badge and £2.

CHINA.

The Civil War.

It is understood that the frontier troops of the Chinese Government are using old French aeroplanes for reconnaissance purposes. The pilots are Chinese.

FRANCE.

The Surrender of a Zeppelin to France.

On July 10th the Zeppelin "L.72" left Friedrichshavn at 21.00 hours in charge of a German crew, with a French naval officer on board, and arrived at Maubeuge at 16.15 hours on July 11th, landing safely two hours lattr. This airship has been surrendered to France under the terms of the Peace Treaty.

The Ministry of Marine sent officers on July 15th to take over officially the L.72. It is to be removed from Maubeuge to Quers (Haute Saone) as soon as hangars are available.

In order that the Parisians may have a passing hour of ecstatic joy, the L.72 is to be flown over the capital on its way to its permanent station.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

Demobilisation Troubles.

News from Valona, where hostilities of quite respectable ferocity are in full swing, show the unwisdom of disbanding squadrons and demobbing Colonial Air Forces in these days. Capt. Coraglia, who had been in command of the Air Force there, had just wound up the affairs of the late Valona squadrons, leaving apparently only one able Caproni *in situ*. Hence the facility with which the Albanians cut off the Italian outposts. A half squadron of Svas have been sent over to put matters straight.

Aeroplanes and the Fiume Insurgents.

As if to bear out the greatly criticised aerial policy of the late Government, three aeroplanes have left the Ghedi-Brescia aerodrome unexpectedly. Presumedly their destination is Fiume, and, anyway, an inquiry is being held into the matter. Almost simultaneously a Nieuport single-seater, one of two, came down between that place and Verona and was there abandoned. These things happened, however, when the urgent need of aircraft in Albania had been made known by the newspapers.

A Fiume Incident.

Rumour reports a Fiume aeroplane, piloted by a lieutenant with a captain as observer, as having been brought down by the Jugo-Slavs over whose domains the machine was reconnoitring. People at the Fiume H.Q. are silent as to the matter. The only thing certain is that a machine which left at 15 o'clock had not returned at 21 o'clock on the same day, July 8th.

The Cameri School.

Chief Pilot Instructor Landini, as the Americans would style him, writes from Cameri that he hopes under the new Ministry to open a military instruction school there.—T. S. H.

JAPAN.

The Japanese correspondent of THE AEROPLANE writes :—

The Completion of the Rome-Tokio-Flight.

The long flight across the continents of Europe and of Asia, from Rome to Tokio, came to an end on the afternoon of May 31st, for the two intrepid Italian aviators. Lieut. Masiero was the first to land; Ferrarin arrived an hour later. The two airmen left Osaka together at 10 o'clock, but became separated owing to the rain and fog, through which the entire journey from Osaka was made. Lieut. Masiero arrived in view of the expectant crowds about 13.15 hours and landed on the parade ground at 13.22 hours, after giving a short exhibition of fancy flying.

A tremendous crowd began to gather on the Yoyogi parade ground by 10 o'clock in the morning, and by the time the leading plane came in view a crowd estimated at 50,000 was thronged around the landing place. All over the city there were groups of watchers, straining their eyes for the first glimpse of the birdmen of whose exploits the papers have been so full lately. At the parade ground soldiers kept the crowds behind the ropes around the landing space. The waiting throng was entertained by three Japanese aviators who went up, partly to amuse the crowd and partly to look for the Italians.

When Lieut. Masiero's machine was sighted Japanese planes set off to accompany it to the landing place. A tremendous ovation was given Lieut. Masiero and his mechanic, Maretto, when the S.V.A. plane finally came to rest. The machine was surrounded by eager admirers, each pressing to be the first to shake the hand of the first man to make the long flight across Asia. Lieut. Masiero, standing in his machine, received the greetings of Major-General Inoue, Chief of Aviation Headquarters; Marquis Paulucci de Caliboli, the Italian Ambassador, and his staff; and many others, among whom were Viscount Uchida, Minister for Foreign Affairs; Mr. Ijuin, former Ambassador to Rome; Vice-Admiral Tochiuchi, Vice-Minister of the Navy; Major-General Sugano, Chief of the Military Affairs Section of the War Office; Mayor Tajiri of Tokio, and members of the Diplomatic Corps of Tokio. Huge bouquets were presented to the men by the ladies of the Italian Embassy. Flowers were showered upon them.

Lieut. Ferrarin made a landing en route. While passing over the Hakone mountains he became doubtful of his way, and in the neighbourhood of Fujiyama he turned back and sought a place to land. He found it at the Kagamigahara Army aerodrome. There he received instructions from Japanese Army flying officers as to his way, went up again and soon arrived at Tokio. He landed on the Yoyogi Parade Ground at 14.25.

After the first rush of greetings was over, the airmen were ushered across the grounds to a pavilion especially prepared for their formal reception by Viscount Tajiri, Mayor of Tokio. At every step they were waylaid by cameramen, with big cameras, small Kodaks, and moving picture machines. Arriving at the pavilion, the Italians were formally welcomed by Mayor Viscount Tajiri, who presented Lieut. Masiero with a medal in the form of a gold chrysanthemum, and the mechanician with a silver chrysanthemum. They were then presented with Japanese swords by the War Office, silver Japanese wine cups by the Navy Office, four silver cigar cases by the party of Japanese aviators, who were dispatched to Italy some time ago, two wreaths of flowers by the Imp. Aerial Society, and many other wreaths by the Reservists Association and other public bodies.

Much the same sort of ovation and reception were given to Lieut. Ferrarin and his young mechanic, Campanini, when they arrived at Yoyogi, except that this time the military authorities, profiting by their experience, managed to rope off a space around Ferrarin's machine as soon as it stopped and to keep the crowds back.

Immediately the formal greetings were over with, Lieut. Ferrarin and his mechanician were escorted, within the guarding circle of rope and soldiers, to the pavilion, where they received the same reception and the same decorations and presents as had been presented to Lieut. Masiero and his mechanic.

When this ceremony was over, Masiero and his mechanics joined with the newly arrived flyers in refreshments. All of the aviators then boarded automobiles and circled the grounds, their progress being marked by the wave of cheering which swept the mass of people who had turned out to pay homage to these daring young men of sunny Italy. About 3.30 the airmen and officials again boarded motor cars, and encircled the grounds once more, after which they drove to the hotel where the aviators are stopping.—N. K.

RUSSIA.

The Campaign in Southern Russia.

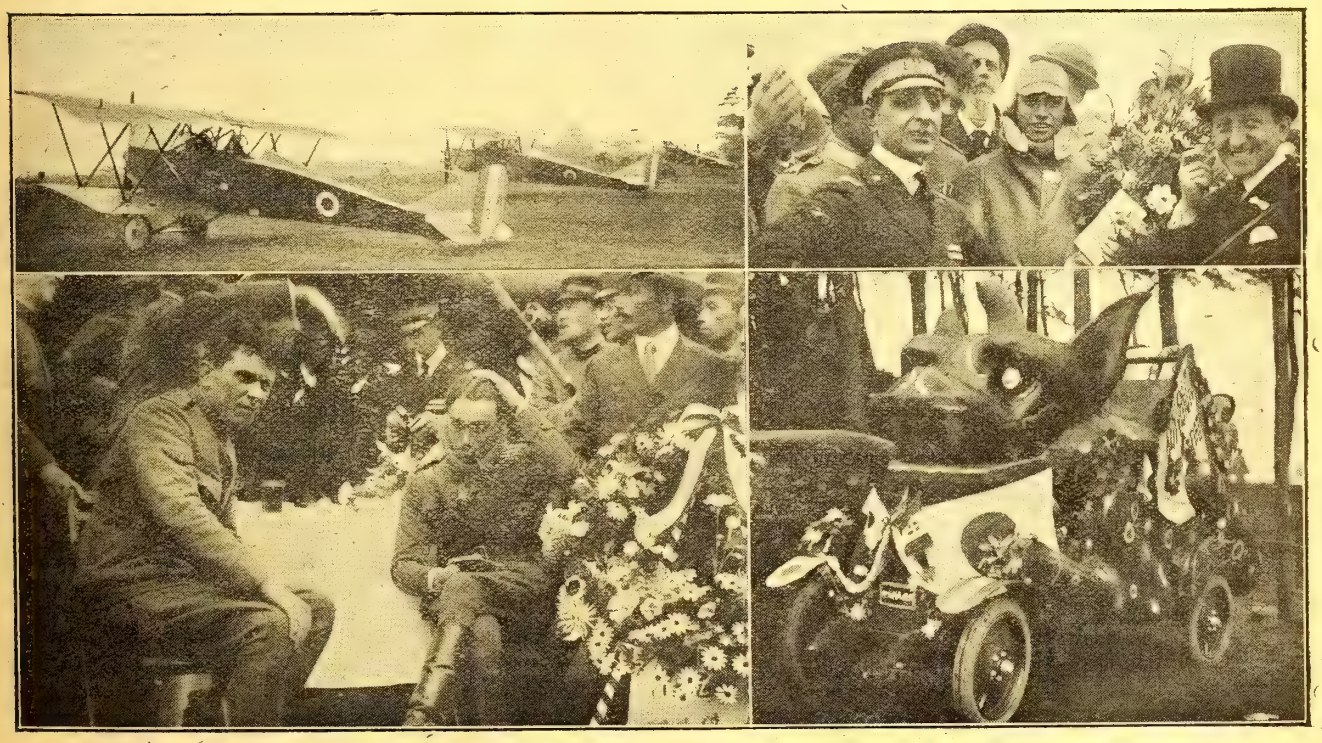
According to a telegram received by the British War Office on July 6th, aeroplanes assisted the forces of General Wrangel in a recent battle against the Bolshevists in the region to the North of the Crimea Peninsula.

A later message from a German source states that twenty aeroplanes were in war materiél taken by General Wrangel.

UNITED STATES OF AMERICA.

An Aerial Survey.

On July 16th four de Havilland army biplanes started from New York for Nome, Alaska. The purpose of the flight is to map out a military and postal air route. The flight will be made in stages of about three hundred miles daily and photographs will be taken of the route. The machines are to fly across Canadian territory to Alaska, and it is hoped to prove the possibility of flying from Nome to New York in three days. Upon arriving at Nome a flight will be made to Cape Prince of Wales, a point only fifty miles from Asia.



The arrival of Lieuts. Masiero and Ferrarin at Tokio at the conclusion of the Rome-Tokio flight. 1. The S.V.As. of Lieuts. Masiero and Ferrarin on the Tokio aerodrome. 2. Lieut. Masiero (in flying cap). 3. Lieut. Ferrarin (with book in left hand) and his mechanic. 4. The triumphal car of the Italian Embassy.

ORDERS, DECORATIONS, AND MENTIONS IN DISPATCHES.

AIR MINISTRY, July 12th.

The King has given orders for the following appointment to the Order of the Bath, in recognition of distinguished services in the recent operations in Somaliland:—

C.B (MILITARY DIVISION).

Group Capt. R. Gordon, C.M.G., D.S.O., R.A.F.

The King has given orders for the following promotion in, and appointments to, the Order of the British Empire, in recognition of distinguished services:—

C.B.E. (MILITARY DIVISION).

ROYAL AIR FORCE.

Sqdn. Ldr. J. O. Archer, O.B.E. (S. Russia); Sqdn. Ldr. H. L. Jackson (Paymr. Lt.-Comdr., R.N.) (omitted in error from "Gazette" of Dec. 22nd, 1919, and to bear that date accordingly); Sqdn. Ldr. N. M. Martin (Somaliland); Sqdn. Ldr. (A./Wing Comdr.) A. C. Maund, D.S.O. (S. Russia); Sqdn. Ldr. (A./Wing Comdr.) F. F. Minchin, D.S.O., M.C. (India).

O.B.E. (MILITARY DIVISION).

Sqdn. Ldr. W. R. Bruce (India); Flight Lt. (A./Sqdn. Ldr.) A. W. Clemson, D.S.C. (S. Russia); Flight Lt. (A./Sqdn. Ldr.) R. Collishaw, D.S.O., D.S.C., D.F.C. (S. Russia); Flight Lt. (A./Sqdn. Ldr.) L. H. Slatter, D.S.C., D.F.C. (S. Russia); Flight Lt. (A./Sqdn. Ldr.) H. A. Tweedie, A.F.C. (India).

M.B.E. (MILITARY DIVISION).

Flying Officer J. Cottle, D.F.C. (48th Sqdn., Afghanistan); Observer Officer A. J. Cox (31st Sqdn., Afghanistan); Flying Officer F. Jezzard (Somaliland); Flying Officer W. J. Rivett Carnac (S. Russia); Pilot Officer (A./Flying Officer) H. H. Weller (S. Russia).

The King has approved of the following rewards for gallantry and distinguished services:—

ROYAL AIR FORCE.

DISTINGUISHED SERVICE ORDER.

Flight Lt. J. W. B. Grigson, D.F.C. (S. Russia); Flying Officer H. P. Lale, D.F.C. (Waziristan).

SECOND BAR TO DISTINGUISHED FLYING CROSS.

Flight Lt. R. Halley, D.F.C., A.F.C. (Afghanistan).

BAR TO DISTINGUISHED FLYING CROSS.

Flying Officer H. C. E. Bockett-Pugh, D.F.C. (Somaliland); Flying Officer J. D. Breakey, D.F.C. (S. Russia); Flight Lt. D. H. M. Carbery, M.C., D.F.C. (Afghanistan); Flying Officer H. P. Lale, D.F.C. (Waziristan); Flying Officer G. E. Randall, D.F.C. (Waziristan).

DISTINGUISHED FLYING CROSS.

Flt. Lt. W. E. Anderson, D.S.O. (S. Russia); Flying Officer M. H. Aten (S. Russia); Flt. Lt. C. Boumphrey (Baltic); Flying Officer E. Brewerton (Baltic); Flying Officer E. A. C. Britton (Waziristan); F. Officer K. H. Brown (114th Sqdn., Afghanistan) (R.F.A.), Flying Officer L. H. Browning, M.C. (63rd Sqdn., Kurdistan); Ob. Officer E. G. T. Chubb (S.Russia); Flt. Lt. R. H. Daly, D.S.C. (S. Russia); Ob. Officer A. E. Evans (63rd Sqdn. Kurdistan) (E. Surr. R.); Flying Officer J. MacG. Fairweather (Baltic); Flight Lt. A. W. Fletcher, A.F.C. (Baltic); Flight Lt. C. F. Gordon, O.B.E., M.C. (S. Russia); Flying Officer J. A. Gray (Somaliland); Observer Officer A. Hesketh (S. Russia); Flying Officer E. R. C. Hobson (Somaliland); Flying Officer S. D. Macdonald (63rd Sqdn., Kurdistan); Observer Officer J. Mitchell, D.S.O. (S. Russia); Flying Officer G. S. Oddie (31st Sqdn., Afghanistan); Flying Officer R. D. C. Palmer (6th Sqdn., Albu Kemal); Lt. P. Phillips (late 63rd Sqdn., Kurdistan); Lt. A. C. Upham (late 114th Sqdn., Afghanistan); Flying Officer C. McC. Vincent (31st Sqdn., Afghanistan).

BAR TO THE AIR FORCE CROSS.

Flying Officer P. W. S. Bulman, M.C., A.F.C. (Experimental Pilot); Flight Lt. W. R. Read, M.C., D.F.C., A.F.C. (216th Sqdn., Palestine (1st D. Gds.)).

AIR FORCE CROSS.

Hon. Lt. (A./Capt.) E. C. Baines (S. Russia); Flying Officer C. O. Bird (late 70th Sqdn., Egypt); Flight Lt. J. S. Browne (216th Sqdn., Palestine); Lt. A. H. G. Dunkerley (70th Sqdn., Egypt); Lt. W. C. Gee (I.A.R.O. (late 214th Sqdn.)); Lt. E. J. Head (S. Russia); Flight Lt. T. Henderson, M.C. (Basrah); Flying Officer E. G. Hilton (70th Sqdn., Egypt), Flying Officer J. B. Jaques, M.C. (D.L.I.) (late 216th Sqdn., Palestine); Sec. Lt. L. H. L'Hollier (Egypt); Wrnt. Officer (1) A. W. Murphy, D.F.C. (Aust. F. Corps, Australia); Flying Officer A. P. Ritchie (S. Russia); Flying Officer H. G. Sawyer (216th Sqdn., Palestine); Lt. J. D. Vance (late R.A.F. and Canadian M.S.C.); Sqdn. Ldr. W. L. Welsh, D.S.C. (216th Sqdn., Palestine); Flying Officer G. W. Wilson (216th Sqdn., Palestine); Capt. H. N. Wrigley, D.F.C. (Aust. F. Corps, Australia); Lt. H. A. Yates (late R.A.F. and Canadian Engrs.).

MENTIONS IN DISPATCHES.

(Dated March 31st, 1920, except where otherwise indicated.)

Flight Lt. W. R. D. Acland, D.F.C., A.F.C. (Baltic); Flight Lt. W. F. Anderson, D.S.O., D.F.C. (S. Russia); Lt. F. G. Aplin, M.C. (Baltic); Sqdn. Ldr. J. O. Archer, C.B.E. (S. Russia); Lt. H. C. Arnold (Baltic); Flying Officer E. H. Attwood (Somaliland), Flight Lt. A. W. Beauchamp-Proctor, V.C., D.S.O., M.C., D.F.C. (84th Sqdn., R.A.F., France) (omitted from "Gazette" dated Jan. 1st, 1919); Flying Officer H. W. Baggs (63rd Sqdn., Kurdistan); Wing Comdr. F. W. Bowhill, C.M.G., D.S.O. (Somaliland); Flying Officer R. C. B. Brading, D.F.C. (Baltic); Lt. A. le G. Campbell (2nd H.L.I., late 63rd Sqdn., Kurdistan); Flight Lt. (A./Sqdn. Ldr.) R. Collishaw, D.S.O., O.B.E., D.S.C., D.F.C. (S. Russia); Flying Officer S. D. Culley, D.S.O. (Baltic); Lt. G. P. W. Earle (Baltic); Flying Officer C. H. Flinn (Somaliland); Flying Officer S. G. Frogley, D.S.O., D.F.C. (S. Russia); Flying Officer O. R. Gayford, D.F.C. (Somaliland); Flying Officer S. R. Gellett (Baltic); Group Capt. R. Gordon, C.B., C.M.G., D.S.O. (Somaliland); Observer Officer E. B. Green, M.C. (Somaliland); Flight Lt. J. W. B. Grigson, D.S.O., D.F.C. (S. Russia).

Flying Officer A. Jerrard, V.C., 14th Wing, R.A.F. (Italy) (omitted from "Gazette" dated Jan. 1st, 1919); Flying Officer S. M. Kinkead, D.S.O., D.S.C., D.F.C. (S. Russia); Flying Officer E. W. Logsdail (Baltic); Sqdn. Ldr. N. M. Martin, C.B.E. (Somaliland); Sqdn. Ldr. (A./Wing Comdr.) A. C. Maund, C.B.E., D.S.O. (S. Russia); Flying Officer R. P. P. Pope, D.F.C. (63rd Sqdn., Afghanistan) (E. Surr. R.); Flying Officer S. H. Potter (Somaliland), Lt. W. Ranger (Baltic); Lt. W. L. Roberts, M.C. (Somaliland) (Middx. R.); Flight Lt. J. G. Skeet, M.R.C.S., L.R.C.P. (Somaliland); Flying Officer L. A. C. Stafford (Somaliland); Wing Comdr. W. Tyrrell, D.S.O., M.C., M.B. (Somaliland); Observer Officer F. A. Whippey, D.F.C. (Baltic); Flying Officer T. M. Williams, M.C., D.F.C. (Baltic); Lt. F. C. Vincent, D.F.C. (Baltic); Flight Lt. F. M. F. West, V.C., M.C., No. 8 Sqdn., R.A.F., France (omitted from "Gazette" dated Jan. 1st, 1919); 334063 Cpl. J. Anderson (Somaliland); 291801 A./C. 2 A. Brown (Somaliland); 336792 A./C. 1 E. W. Bruce (Somaliland); 95921 A./C. 1 L. C. Bunkall (Somaliland); 950 S./M. 1 C. E. H. Bunting (Somaliland); 275943 A./C. 1 J. A. Burrow (Somaliland); 302676 Cpl. J. Coffey (Somaliland); 302628 W./O. 1 T. Desmond (Somaliland); 334212 Sjt. E. Evans (Somaliland); 200505 Flight Sjt. H. J. Fergusson (Somaliland); 302630 W./O. 1 W. Gamblen (Somaliland); 127036 A./C. 1 A. E. Hester (Somaliland); 340350 Cpl. A. Hutchinson (Somaliland); 28834 Sjt. J. Kinggett (63rd Sqdn., Kurdistan); 340273 L. A. C. McKee (Somaliland); 402039 Cpl. W. H. Sydenham (Somaliland); 140102 A./C. 1 T. G. Turrill (Somaliland).

PROMOTED TO FLIGHT LIEUTENANT FOR DISTINGUISHED SERVICE IN THE FIELD.

Flying Officer J. W. Hosking, M.B.E. (Somaliland).

DISTINGUISHED FLYING MEDAL.

26645 Cpl. J. T. Bunting (63rd Sqdn., Kurdistan); 19154 Sjt. P. I. David (63rd Sqdn., Kurdistan); 206740 Cpl. H. W. Pickrell (63rd Sqdn., Kurdistan); 31105 Sjt. S. C. Spink (63rd Sqdn., Kurdistan).

AIR FORCE MEDAL.

103406 Sjt. T. Aspley (216th Sqdn., Palestine); 59728 A./Sjt. C. G. Barnes (216th Sqdn., Palestine); 314123 Sjt. A. D. Booth (214th Sqdn., Egypt); 204117 Actg. W.O. W. S. Burville, D.S.M. (214th Sqdn., Egypt); 204479 Flight Sjt. H. Cadman (214th Sqdn., Egypt); 47966 A./C. 1 T. Y. Cordiner (late 58th Sqdn., Egypt); 723 S./M. 1 H. A. Gamon (216th Sqdn., Palestine); 314863 Flight Sjt. W. J. Glyde (216th Sqdn., Palestine); 277072 A./M. 2 C. F. Hand (Egypt); 249303 L.A.C. F. C. Holmes (216th Sqdn., Palestine); 204161 Flight Sjt. P. McDiarmid (216th Sqdn., Palestine); 56796 A./C. 1 A. D. C. Martin (late 58th Sqdn., Egypt); 202859 Sjt. J. Parkes (Airship R.29, East Fortune); 104480 L.A.C.G. A. E. Pritchard (70th Sqdn., Egypt); 98510 L.A.C. E. Stedman (Egypt); 76140 Sjt. P. Waddingham (216th Sqdn., Palestine); 219086 Cpl. G. E. West (216th Sqdn., Palestine); 140482 Cpl. T. Vose (216th Sqdn., Palestine); 3592 Flight Sjt. J. Yeadon (70th Sqdn., Egypt).

MERITORIOUS SERVICE MEDAL.

203984 Cpl. F. W. G. Aggett (S. Russia); 82022 A./Sjt. T. G. A. Aggus (S. Russia); 109438 A./C. 2 J. Aitkenhead (S. Russia); 207121 L.A.C. W. C. Blackwood (S. Russia); 314123 Sjt. A. D. Booth, A.F.M. (Somaliland); 157159 A./C. 1 E. W. Braund (S. Russia); 54480 Cpl. F. F. F. Bulman (Somaliland); 338009 Flight Sjt. W. H. Cheffins (Somaliland); 277405 A./C. 2 L. C. Clay (S. Russia); 230556 Cpl. C. R. Coe (S. Russia); 217781 A./C. 1 L. V. Cooper (S. Russia); 229436 Sjt. H. H. Coward (Baltic); 204005 Flight Sjt. A. J. Crook (Somaliland); 230872 A./M. 3 L. S. Davies (S. Russia); 103095 L.A.C. J. Ellis (Baltic); 200599 S./M. 1 S. P. Finch, D.S.M. (S. Russia); 51210 Cpl. H. G. Goacher (S. Russia); 107444 A./C. 1 J. Grant (S. Russia); 65968 L.A.C. J. R. Gray (Somaliland); 304104 A./C. 1 R. King (Somaliland); 141436 A./C. 2 J. Knowles (S. Russia); 10697 L.A.C. E. E. Lockyer (Somaliland); 62129 T./Sjt. W. E. Maddocks (S. Russia); 244083 L.A.C. (A./Cpl.) T. A. Pattinson (S. Russia); 200765 Flight Sjt. L. Penicud (Mesopotamia); 37966 Cpl. A. H. Peacock (S. Russia); 243966 L.A.C. (A./Cpl.) W. J. Plank (S. Russia); 69340 Cpl. S. W. H. Pound (S. Russia), 141225 A./C. 1 A. Rowbotham (S. Russia), 203496 A./C. 2 H. Sadler (S. Russia); 410372 Flight Sjt. W. Sharp (Somaliland); 313247 Flight Sjt. A. A. Shephard (S. Russia); 226425 L.A.C. M. H. W. Short (S. Russia); 42243 Sjt. P. A. Simpson (Baltic); 224616 Flight Sjt. E. G. Smith (Baltic); 67503 Cpl. G. E. Southcott (20th Sqdn., N.W.F., India); Sjt. F. Stanley (Baltic, H.M.S. *Vindictive*); 210778 Cpl. F. M. Stuart (S. Russia); 102474 Cpl. J. Telford (Somaliland); 403683 L.A.C. J. Turton (S. Russia); 130334 L.A.C. J. W. Walker (S. Russia); 58767 L.A.C. (A./Cpl.) F. O. Webster (S. Russia); 35298 Cpl. E. C. White (Somaliland); 244093 A./C. 1 J. T. Wren (S. Russia).

CORRECTIONS.

The following are the correct descriptions of officers and other ranks whose names have appeared in the "Gazettes" indicated:—

Maj. George Martin Treharne Rees, O.B.E. ("Gazette," Jan. 1st, 1919); Sec. Lt. (A./Capt.) Robert McLorinan Freemantle, M.B.E. ("Gazette," Jan. 1st, 1919); Capt. Leonard Edward Lander, M.B.E. ("Gazette," Jan. 1st, 1919); Capt. (A./Maj.) James Bogue Elliott, O.B.E. (Rif. Bde.) ("Gazette," Jan. 1st, 1919); Maj. Percy Bernard John Murrell, O.B.E. (R.N.V.R.) ("Gazette," Jan. 1st, 1919); Capt. Frank Jefcoate, M.B.E. (appointment to the Order of the British Empire, 5th Grade, is now altered to date Jan. 1st, 1919, instead of June 3rd, 1919, as published); Capt. Albert Urbain Hansford, M.B.E. ("Gazette," Jan. 1st, 1919); Asst.-Administrator Miss Marion Annie Thomson, M.B.E. ("Gazette," Jan. 1st, 1919); Lt.-Col. Jasper Wallace Cruikshank, O.B.E. (Durh. L.I.) ("Gazette," Jan. 1st, 1919); Capt. (A./Maj.) Charles Fradsall Yeomans, O.B.E. ("Gazette," June 3rd, 1919); Administrator Mrs. Constance Theodora Bayley, M.B.E. ("Gazette," June 3rd, 1919); Flight Lt. Percy William Smith, O.B.E. ("Gazette," Oct. 10th, 1919); Capt. (actg. Maj.) Alexander Morice Wilson (4th Gord. Highrs.), awarded the M.B.E. in "Gazette" of June 3rd, 1919, in error, is now promoted to the 4th Grade, Mil. Div. (O.B.E.) from that date inclusive.

FOREIGN DECORATIONS.

The King has granted unrestricted permission for the wearing of the undermentioned decorations, conferred on officers of the Royal Air Force for valuable services in connection with the war:—

CONFERRED BY THE KING OF ITALY.

Order of the Crown (Officer).—Wing Comdr. Alfred Hearst Wynn Elias Wynn, O.B.E.

Order of the Crown (Cavalier).—Flight Lt. Arthur Rowan, Flight Lt. Ferdinand Maurice Felix West, V.C., M.C.

CONFERRED BY THE KING OF THE HELLENES

Greek Military Medal, 3rd Class.—Capt. John Banks Walmsley, D.F.C. (Indian Army); Flying Officer Charles Basil Slater Spackman, D.F.C.; Sec. Lt. John Hunt Furniss, M.B.E.; Maj. Alexander Morice Wilson, O.B.E. (Capt., 4th Gord. Highrs.).

The King has approved of the award of the Military Cross to Observer Officer Josiah Edward Truss, 114th Sqdn., R.A.F., for bravery against the enemy in the field on July 27th, 1919, between Loralai and Quetta.

AIR MINISTRY, July 14th.

The King has been pleased to approve of the following rewards in recognition of the valuable services rendered to aviation in the experimental flight (Vickers "Vimy" machine) organised by the *Times* newspaper in an attempt to fly from England to South Africa. The flight commenced at Brooklands, Surrey, on Jan. 24th, 1920, and ended at Tabora (2,628 miles from Cairo) on Feb. 26th, 1920, at which point the attempt to continue the flight to Cape Town had to be abandoned.

THE AIR FORCE CROSS.

Capt. Frank Crossley Griffiths Broome, D.F.C., late Royal Air Force.
Capt. Stanley Cockerell, late Royal Air Force.

THE AIR FORCE MEDAL.

8085 S./M. 1 James Wyatt, late Royal Air Force (Engineer).
Mr. Claude Corby, Aeroplane Rigger (Messrs. Vickers Ltd., Aviation Department).

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ENGINE STANDS AT OLYMPIA.—Left, Top to Bottom: The Sunbeam Stand, with the 6-cylinder Vertical "Sikh" of 450 h.p. in the centre; the Napier Stand. And the Hispano-Suiza Exhibit. Right, Top to Bottom: The Bristol Engines with the geared "Jupiter" in the foreground. The Zeitlin engine and its inventor. And the Gwynne exhibit of rotary engines, Clergêts, and B.Rs.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

AERO ENGINES AT OLYMPIA.

Whatever may be felt as to the advance in the design of British aircraft since the Olympia Show of 1914, the present exhibition demonstrates conclusively that the British Aero Engine Industry has advanced enormously since pre-War days.

In the Show of 1914 there was a larger aggregate number of aero engine exhibits—13 makes then appearing as against nine at the present Show. But of the 13 makes of 1914 but five were of purely British design and of these five two alone ever survived to be used in the air to any extent, and of these two makes examples of 1914 type still exist and still fly. Two makes of foreign design but of British manufacture were to be seen.

To-day, of the nine engine makers' exhibits, but one—the Hispano-Suiza—is wholly foreign, and one other consists partly of engines designed under licence from foreign patentees, and this one is not by any means an exhibit of mere copies of a foreign engine.

Further, there is but one engine—exhibited as such—in the whole of Olympia of a make which has not already demonstrated its qualities in the air.

In 1914 the monster engine of the Show was the 225-h.p. 12-cylinder Sunbeam—afterwards famous for its exploits in seaplanes of the R.N.A.S.—to-day the biggest engine remains a Sunbeam but of four times that output.

This in itself marks one important step. If aircraft are to become the common carriers of civilisation, still greater outputs from a single unit must be developed.

Distinctions and Differences.

In some respects a comparison of the engines of 1914 and those of 1920 produces similar impressions to those which result from a comparison of the aeroplanes of the same dates. Thus there were in 1914 engines of the rotary, of the radial, of the vertical and of the Vee type, both air- and water-cooled, with cylinders ranging in number from four to twelve. To-day there are rotaries and radials air-cooled, and vertical, Vee and broad arrow types water-cooled. The minimum number of cylinders has become two, the upper limit remains at 12.

So that here again there seems little to encourage those who would dogmatise as to the disappearance of any one type of engine, or the future predominance of some specific form thereof.

There certainly seem to be grounds for believing that ere long the various types of aero engines will settle down and assume for themselves fairly closely defined spheres of utility.

For instance, the rotary has already shown that it is eminently suitable for use in small light types of aircraft, where a high performance and excellent manœuvrability are necessary, and a certain extravagance of fuel and oil—the latter somewhat untidily distributed over the machine—can be condoned. It owes its suitability for this purpose mainly to its perfect dynamic balance and uniform torque, which permit of its attachment to extremely light frameworks without risk from the effects of vibration.

The stationary radial type has presumed to challenge the rotary within its own sphere, and with some success. It may equal the rotary in compactness, in weight to power ratio, and can easily defeat it in fuel and oil consumption. Nevertheless the fact that the crank and therefore the big end of a stationary radial rotate introduces inertia forces which mean either excess weights applied to the crankshaft for balancing purposes, or periodic vibrations. Further, the stationary radial is devoid of the flywheel effect of rotating cylinders, and the aeroplane framework is therefore subject to the effects of torque variation.

Thus, power for power, the stationary radial calls for more substantial mountings and a heavier machine—drawbacks which cease to be important for flights of such duration that the decreased weight of oil and fuel consumed by the radial offset this added structure weight. Stationary radials can, however, be built for much greater outputs than can rotaries.

Advantages and Otherwise.

In weight of engine and of the structure required to carry it both rotary and radial score heavily over any vertical or Vee type engine. In fuel and oil consumption the water-cooled stationary has a considerable advantage over the rotary, and some over the best of the fixed radials. It is, at the present, considerably more reliable where long duration flights are in question than either the rotary or the radial. This advantage over the rotary will probably never disappear, but the weakness of the radial in this respect is solely due to one factor—and may be overcome. That factor is the small space available for crankpin bearing surface, and the large inertia loads transmitted thereto by the multiplicity of reciprocating parts which are attached in this particular class of engine. This difficulty overcome, there seems no reason why the radial should not compare favourably with the normal type in reliability.

Till it is overcome the fixed water-cooled type should be secure for all purposes where reliability and economy are of chief importance and the last shred of performance can be dispensed with.

Thus, granting that rotaries survive—the only doubtful question involved—it seems safe to assume that they will be confined to small high-performance machines for sporting uses.

For extreme performance—racing, record-breaking and certain military purposes involving moderate flight durations—the stationary radial air-cooled type should shortly secure a clear field.

For the vast majority of commercial purposes, and for all such warlike uses as call for the highest degree of reliability and economy, it seems to be extremely improbable that any other type can replace the water-

cooled multiple crank type of engine. At Olympia these suggested spheres of utility for the various types of engine are not particularly obviously demonstrated by the engine installation in the actual aeroplanes.

This is due to the fact that the choice of engines by aircraft designers is at the moment more influenced by the available supply of surplus engines left over from war years than by the intrinsic merits of the various types themselves.

However, the fact that at the exhibition—mainly composed of craft destined for peaceful pursuits—out of 27 machines no less than 21 are fitted with stationary vertical, Vee, or three-row engines, one only of these being air-cooled would seem to confirm that at present the water-cooled type is predominant for the purposes of civil transport.

The only two rotaries in aeroplanes are in small, light and fairly high performance sporting type machines—which shows that the rotary is not largely used outside the sphere above apportioned to it.

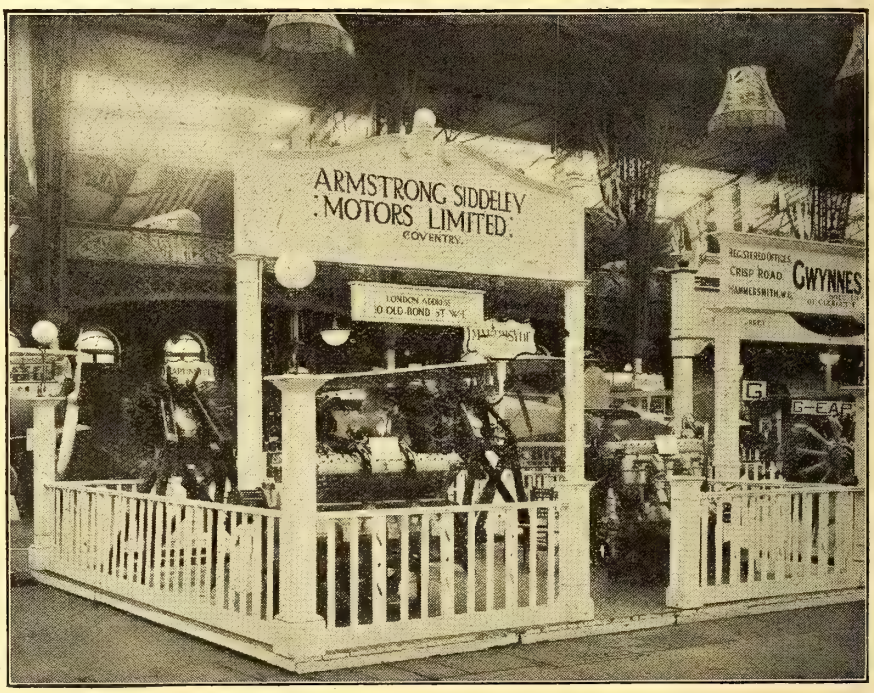
Of the remaining four engine installations one consists of a modern high-power radial fitted to a very high performance fighter, one of a two-cylinder opposed air-cooled engine fitted to a machine whose simplicity and low cost is its main feature, and the remaining two are radial engines of a relatively ancient type, fitted to machines where performance has given way to simplicity and economy, and the choice of engines has obviously been dictated by the fact that these engines could be obtained, and that no other engine of similar power and equal reliability could be purchased at a similar price.

In actual design, in the more effective use of materials, in general reliability and economy, the average aero engine of 1920 is far in advance of that of 1914. That advance—like the similar advance in the design of aeroplanes—has resulted from the needs of war and not from any commercial requirements. Yet it has served to provide the beginnings of aerial transportation with power-plants which go some way towards fulfilling the present needs, and as in the aeroplane itself so in the aero engine one may safely expect the next few years to produce even greater advances in economy and reliability than have the past six.

But here again hard work, courage, and imagination are called for and cannot be replaced by any measures of official nursing.

ARMSTRONG-SIDDELEY MOTORS, LTD., Coventry.

THE ARMSTRONG-SIDDELEY STAND AT OLYMPIA.—In the near corner the great 500-h.p. "Tiger" is partly concealed by the rails and corner post. On the right the smaller "Puma" can be seen. At the far side of the stand the two new air-cooled radials are on their trestles. The left-hand of the two is the 300-h.p., the right-hand the 150-h.p. The little two-cylinder engine of 40-h.p. is not visible in this photograph.



On the stand of Armstrong-Siddeley Motors, Ltd., the chief novelty is to be found in the two aircooled engines which now make their first public appearance.

The little two-cylinder 40 h.p. engine, designed for sporting type machines properly belongs with its two larger relatives, but has appeared to the public eye before.

These three have many features in common which may well be dealt with at one and the same time.

All are equipped with steel cylinders screwed into aluminium heads; these heads extend some way down the barrels, and roughly half the cooling fins are part of the steel cylinders, the other half being part of the aluminium heads.

The top of the cylinder heads is a flat surface supported by two pairs of bracket webs towards the airscrew face of the cylinders which extend down parallel to the cylinder axis for about half the depth of the whole head. Immediately above these webs are the brackets which carry the valve rocker trimmers.

Thus there is provided a really stiff mounting for these bearings, without the need either for steel heads, or for any very great mass of the weaker alloy.

The cylinders of all three aircooled engines are of the same bore and stroke, and it may be assumed that valves and pistons are equally standardised.

The valves themselves are two per cylinder, operated in the big engines by push rods from a cam casing mounted between the crankcase and the airscrew boss, and concentric with the crankshaft. In the two larger engines the motion of the push rods is transmitted to the valves by rocker arms of normal type, but in the two-cylinder engine the arrangement is rather different.

In this the push rod operates upon a crank on the outer end of a rocking shaft, which passes through bearings mounted above the cylinder head running parallel to the crankshaft.

The inner end of these shafts again carry crankends, which in turn operate on the valve stem ends.

All three engines are fitted with roller bearings for their crankshafts, and either roller or ball bearings throughout the remainder rotating parts.

The crankcase is an aluminium casting, cylindrical in general form, and closed fore and aft by covers, which in the case of the front cover carries the cam and auxiliary gears, oil pumps, the magneto, and the Remy distributor drives.

A MODEL OF THE

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The rear cover in the case of the two larger engines contains an induction gas mixing chamber wherein it is rumoured there is to be found a blower which ensures the fullest possible charging of the cylinders. Heavy cast feet project from this cover and these are fitted with steel bushed and threaded holes for the bolts to secure the engine to the frame.

All these engines are fitted with dual ignition by magneto and by the Remy coil and battery and distributor system.

Lubrication is on the dry sump principle, with one scavenger pump draining the crankcase and one pressure pump forcing oil through the crankshaft to crankshaft, big end, bearings, and to the timing gears.

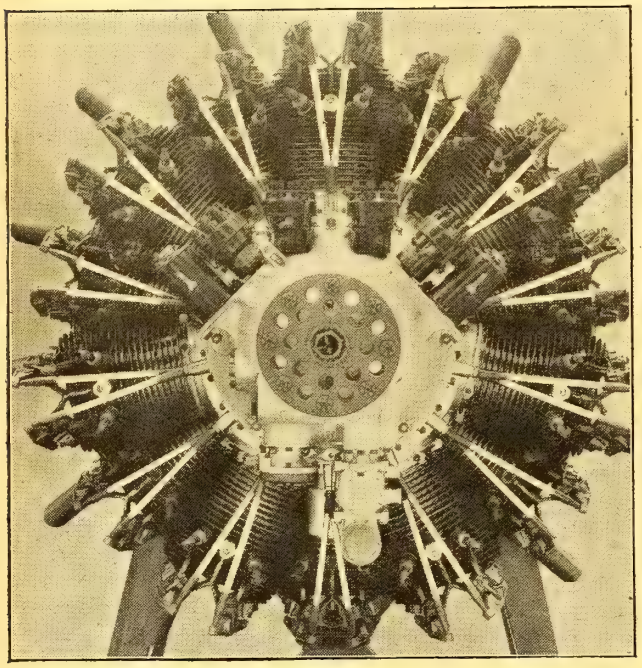
Radial induction pipes lead from the gas chamber at the rear of the crankcase to the inlet valves, and a ring manifold collects the exhaust gases and emits them low down on the left side (looking at the airscrew).

The little two-cylinder 40 h.p. engine has the carburetter mounted below the crankcase with upslanting induction pipes and a separate exhaust spout to each cylinder.

The magneto is in this case mounted on top of the crankcase, and the cams, instead of being on a concentric ring round the crankshaft, are in the upper half of the crankcase.

The smaller of the two radials is a seven-cylinder single-row radial developing 150 b.h.p.

The larger one is practically a doubled edition, with two rows of cylinders, seven in each, staggered and driving a two-throw crankshaft, and developing 300 b.h.p.

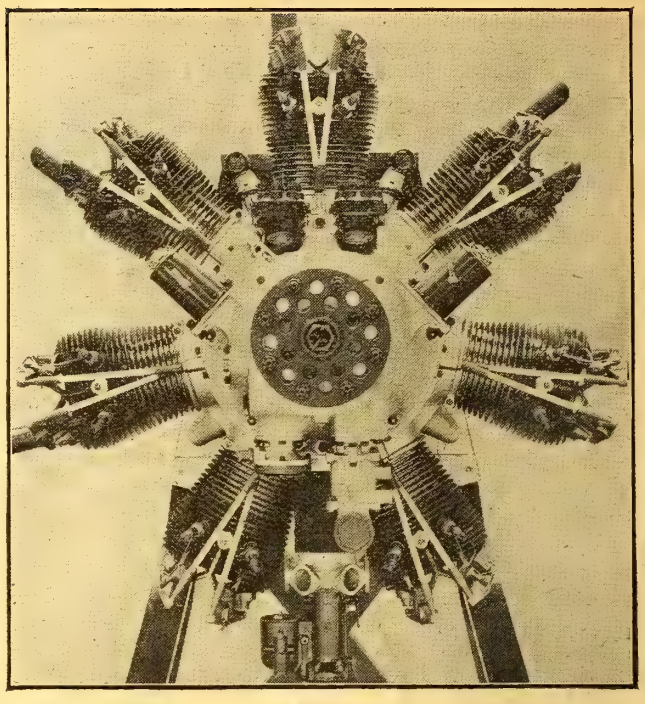


Front view of the Armstrong-Siddeley 300-h.p. Radial Engine.

Of their dimensions, etc., all that can be gathered is included in the appended specifications.

Specifications of the Armstrong-Siddeley Aircooled Engines.

Engine	40 h.p.	Oil consumption per hr.	2.3 pt.
No. of cylinders	2	Weight	170 lb.
Bore	5 in.	Overall diameter	39.5 in.
Stroke	5 in.	Overall length	20.5 in.
B.H.P.	45	No. of fixing bolts	4
R.P.M.	1,500	Pitch dia. of fixing bolts	15 in.
Petrol consumption per hr.	3.5 gall.		
Engine	150 h.p.	Oil consumption per hr.	7.5. pt.
No. of cylinders	7	Weight	390 lb.
Bore	5 in.	Overall diameter	42 in.
Stroke	5 in.	Overall length	33.5 in.
B.H.P.	150	No. of fixing bolts	4
R.P.M.	1,500	Pitch dia of fixing bolts	23 in.
Petrol consumption per hr.	10.25 gall.		
Engine	300 h.p.	Oil consumption per hr.	18 pt.
No. of cylinders	14	Weight	680 lb.
Bore	5 in.	Overall diameter	42 in.
Stroke	5 in.	Overall length	41 in.
B.H.P.	300	No. of fixing bolts	7
R.P.M.	1,500	Pitch dia of fixing bolts	23 in.
Petrol consumption per hr.	20.5 gall.		



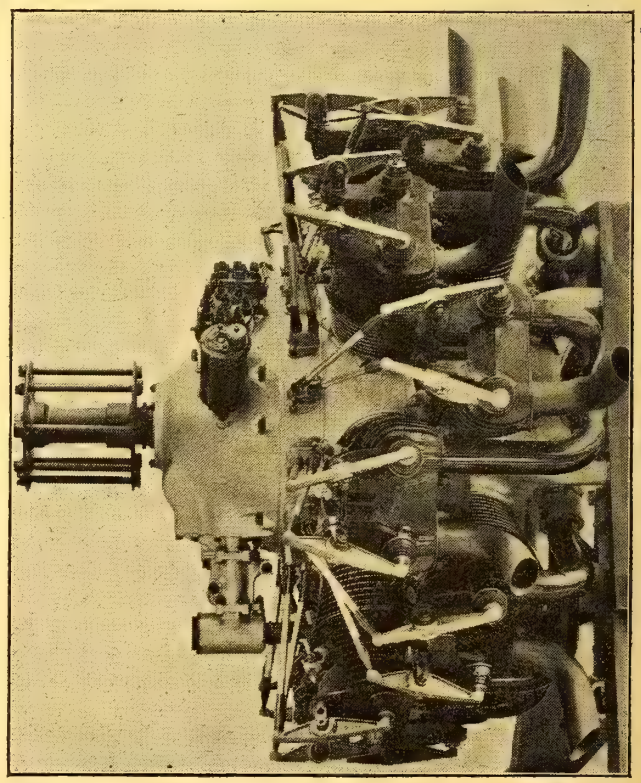
Front view of the Armstrong-Siddeley 150-h.p. 7-cylinder Radial Engine.

The remaining Siddeley engines are of the water-cooled type, one of them the well-known "Puma" of 230 h.p., and the second the less familiar "Tiger" of 500 h.p.

These engines again have between them many points in common.

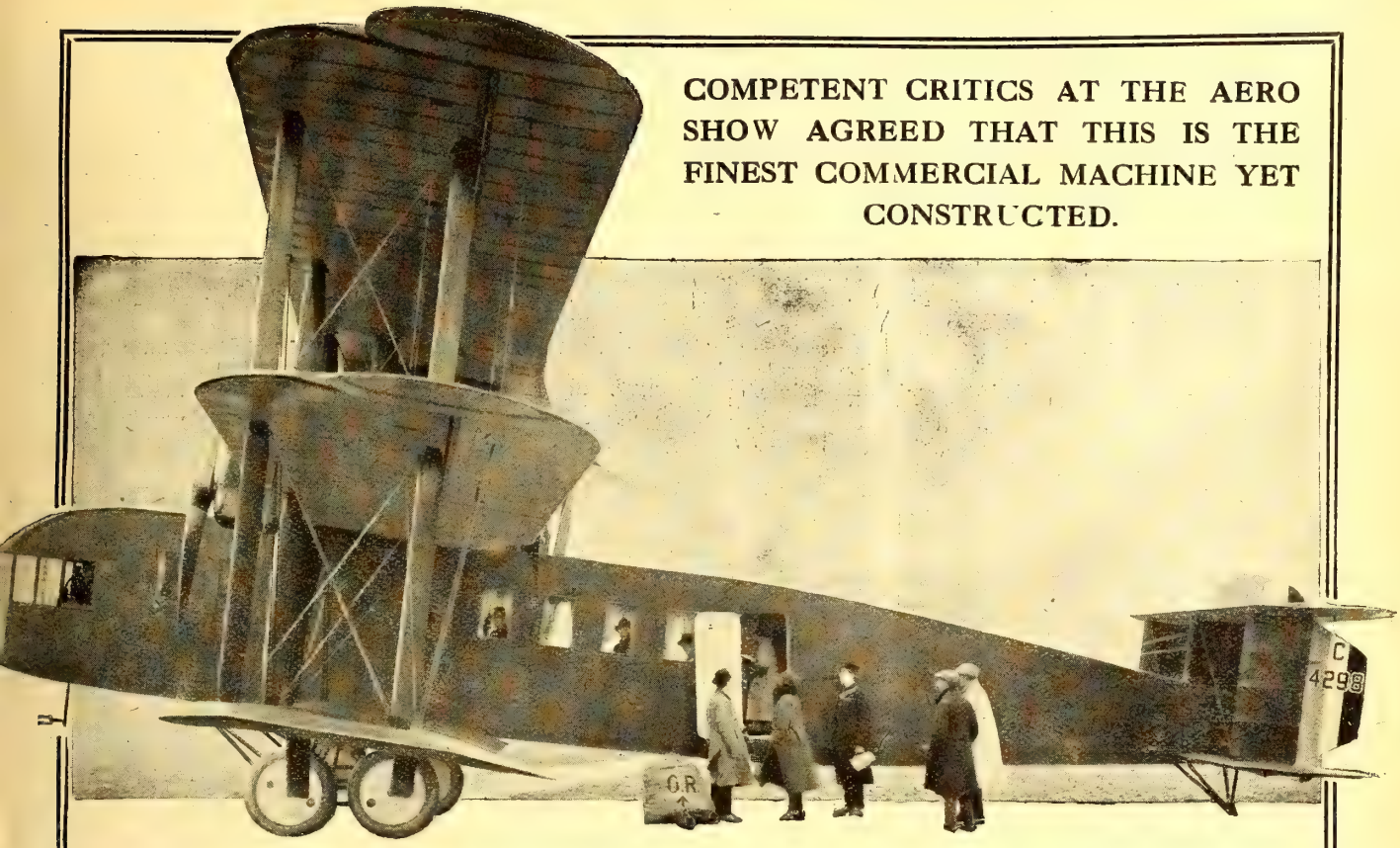
All cylinders are of steel, screwed into aluminium heads. These heads are each common to three cylinders, which thus form a block, the "Puma" possessing two such, and the "Tiger" four in two rows. Overhead camshafts carried in the upper portion of these heads operate the valves, whereof both engines have two exhausts, the "Tiger" two inlets, and the "Puma" but one inlet.

The cylinders are mounted upon a split cast aluminium crankcase, the upper half whereof carries the whole engine,



The 14-Cylinder 300-h.p. Armstrong-Siddeley Engine in side Elevation.

COMPETENT CRITICS AT THE AERO SHOW AGREED THAT THIS IS THE FINEST COMMERCIAL MACHINE YET CONSTRUCTED.



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and is provided with massive cast feet for the support thereof in the aeroplane. The lower crankcase half serves the purpose of an oil collector and guard, and is kept free from oil by the scavenging half of the double oil pump, the other portion whereof force-feeds all the important bearings.

The whole of the valve and auxiliary driving gear is fitted to the end of the crankcase farthest from the airscrew shaft, where the whole of the parts likely to need attention are readily accessible.

The "Puma" is of the vertical six-cylinder type, and did extremely good work during the war, and has gained an excellent reputation in civilian service since. Its normal output—240 h.p.—is of the power which can be used in that most useful type of aeroplane, the medium-sized moderate speed mail or passenger carrier, a type for which its simple construction and easy installation renders it specially suited.

The "Tiger," which was forestalled by a premature Armistice, had no opportunities during war, and has not yet come into use in civil aviation. Its output, 500 h.p., renders it suitable for the largest types of single-engined machines, and within a short time it may be expected to show itself a worthy companion to its smaller relative, the "Puma."

It is, in fact, two slightly enlarged "Pumas" set to driving a common crankshaft, and in all its details it appears to follow "Puma" practice.

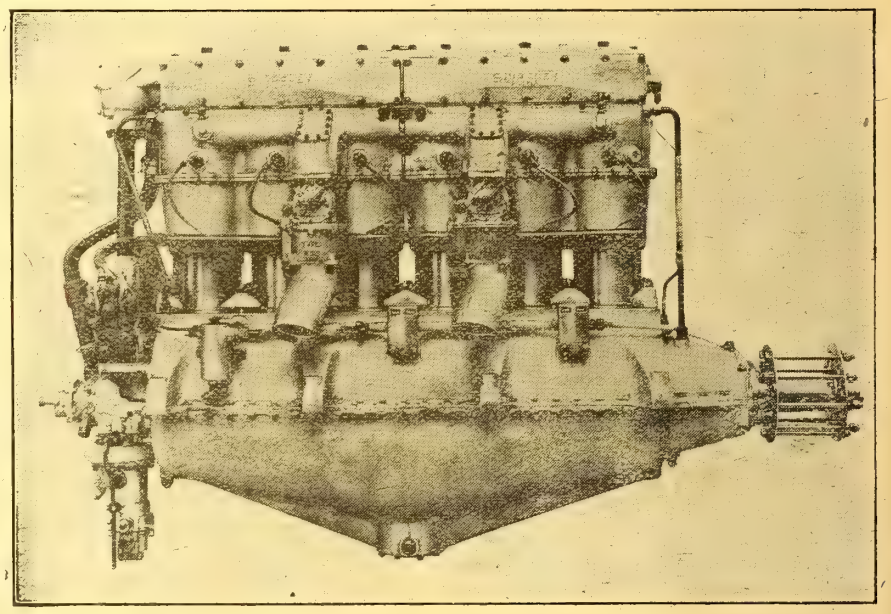
The dimensions, etc., of the two "cat tribe" engines are given below side by side for comparison.

Specifications of the Armstrong-Siddeley Watercooled Engines.

"Puma."			
No. of cylinders	6	Oil consumption per hr.	10 pt.
Bore	5.7 in.	Weight (dry)	636 lb.
Stroke	7.5 in.	Overall width	24 in.
B.H.P.	246	Overall height	44 in.
R.P.M.	1,400	Overall length	70 in.
Petrol consumption per hr.	17 gall.	Bearer centres	17.2 in.

"Tiger."			
No. of cylinders	12	Oil consumption per hr.	20 pt.
Bore	6.3 in.	Weight (dry)	1,600 lb.
Stroke	7.1 in.	Overall width	34 in.
B.H.P.	500	Overall height	40 in.
R.P.M.	1,500	Overall length	82 in.
Petrol consumption per hr.	35 gall.	Bearer centres	25.6 in.

THE SIDDELEY "PUMA" ENGINE.—The characteristic feature of this engine is the extensive use of aluminium in its construction. The cylinders are composite and consist of two aluminium blocks each comprising three cylinders whereinto three separate steel cylinder barrels are pressed. The two cylinder blocks are then united to a single cylinder head, which also forms the camshaft casing and contains the whole of the valve gear.



WM. BEARDMORE, LTD., Dalmuir.

In addition to the aircraft exhibits on the Beardmore stand there is to be seen a specimen of the 160 h.p. Beardmore engine.

At the outbreak of war the standard Beardmore engine was a six-cylinder vertical of 120 h.p., and this engine gave, in the service of the R.F.C., most excellent results. 120 h.p., however, did not suffice for long to meet the demands of aeroplane designers, and, as their needs were pressing, the 120 Beardmore was modified by fitting it with larger cylinders. If one remembers aright little else was changed, but so excellently was the adaptation carried out that that engine, the 160 h.p. Beardmore, stands to-day as one of the most reliable and efficient of aero engines.

Beardmores realised the value of their product for commercial purposes and after the Armistice they purchased from the Disposals Board the whole stock of these engines, and are prepared to sell them, overhauled, renovated where necessary, and guaranteed to be better than new.

The 160 h.p. Beardmore is of the six-cylinder vertical type, with separate cylinders, copper jacketed, and overhead valves. These valves are operated through rocker arms and push and pull rods by a camshaft arranged at the side of the crankcase. One push and pull rod and one rocker arm actuates both inlet and exhaust valve on each cylinder, the rocker arms being pivoted midway between the two valves, and the cams being of the double type—i.e., a pulling ring surrounding the normal pushing cam—and thus impart positive motions in opposite directions to the rods.

Specification of the Beardmore 160 h.p. Engine.

No of cylinders	6	Petrol consumption	0.52 lb. per h.p. hr.
Bore	142 mm.	Oil consumption	0.03 lb. per h.p. hr.
Stroke	175 mm.	Weight dry	600 lb.
B.H.P.	180		
R.P.M.	1,400		

To their 160 h.p. engine the Beardmore concern now fit a starting gear, which is used on all the Beardmore aeroplanes.

This gear consists of three essential parts, a hand-operated magneto, a doping pump, and turning-gear.

The operation of the system is as follows :—A small quantity of petrol is injected into each of the six inlet valve pockets of the engine. The engine is then turned by the gear to compress the mixture drawn in from the pockets, and the hand magneto is operated, igniting the injected petrol, the engine then picks up on the carburetter supply. There is one feature of the Beardmore scheme which is of note, viz., that enough petrol is injected into the inlet pocket and piping to keep the engine running for several revolutions.

The doping pump is of very simple design, having only two ball valves. The pump and petrol reservoir are one piece, the pump barrel being a small tube inside the large one comprising the reservoir. The two valves and the pump piston comprise all the moving parts. When the petrol is forced out of the pump to the inlet valve pocket it is not allowed, as in some cases, to enter the pocket in a solid stream, but is made to force a small coned valve off its seat. This valve is spring loaded, and has its lift limited to a very fine amount, thus breaking up the stream of petrol into a very fine spray, and assisting materially in obtaining easy starting.

The gear for turning the engine is fitted on the rear of the camshaft, and is of very compact form. Briefly, a flange on which clutch dogs are cut is bolted to the camshaft driving wheel. The casing for the timing gear is taken off and a casing carrying a worm and worm wheel substituted. Inside the worm wheel is a sliding piece, having clutches cut upon it to engage with those formed upon the flange on the camshaft driving wheel. This sliding piece is held out of engagement by a spring-operated lever, by means of which the gear is connected to the pilot's cockpit in the machine. In addition, for turning the engine from the cockpit, a chain or other drive is connected to the worm shaft, thus enabling the engine to be started without leaving the seat.

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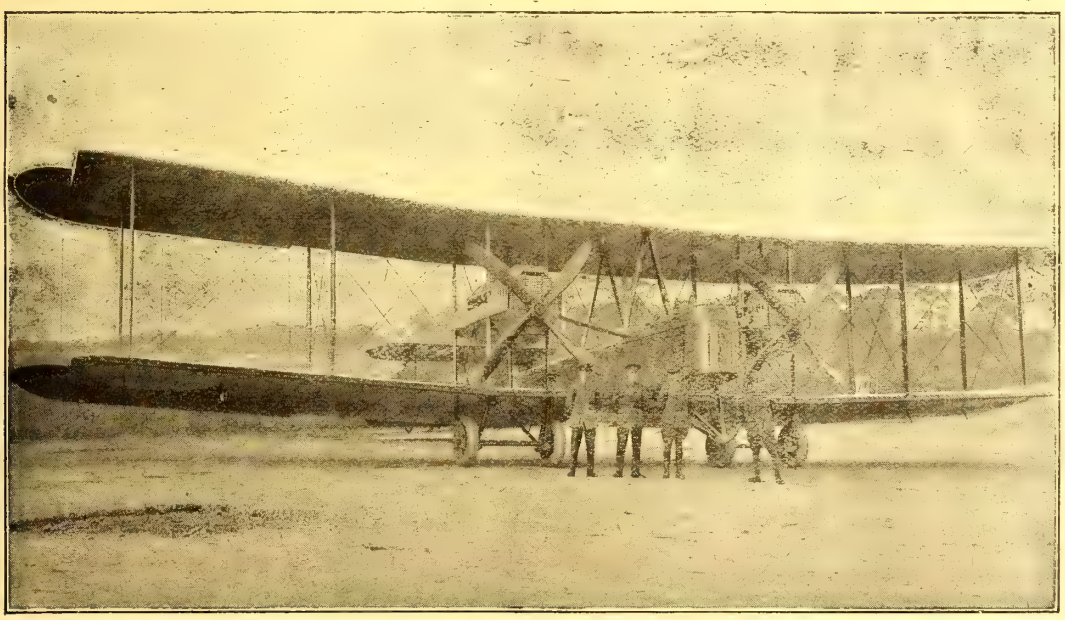

The Aeroplane that successfully accomplished the flight to Australia.

The first flight from England to Australia and the first direct Transatlantic flight, was accomplished on a Vickers-Vimy-Rolls Aeroplane.

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THE BRISTOL AEROPLANE CO., Ltd., Filton, Bristol.

Adjoining the Bristol Co.'s aeroplane exhibit there is to be seen a stand which forms the first official announcement that the Bristol Aeroplane Co. have now taken over the patent rights in the air-cooled radial engines which were formerly made by the Cosmos Engineering Co., Ltd., and propose to carry on the development of the type.

This is a welcome sign that the experimental work already carried out by Mr. Roy Fedden is not to die with that firm, and is a striking tribute to the enterprise of the Bristol Company.

The exhibits consist of examples of the "Jupiter I" and "Jupiter II" nine-cylinder radials, the Mark I of 450 h.p., air-cooled, with a direct airscrew drive, and the Mark II, the same engine with the airscrew geared down, and the three-cylinder 100-h.p. "Lucifer" engine.

The "Jupiter" Mark I.

The main features of these engines lie in the cylinder construction and in the ingenuity of their detailed design. The cylinders are of steel, turned from forgings, with an integral combustion head. To this the cylinder head proper, an aluminium casting with valve pockets and gas ports, is applied in suchwise that intimate mechanical contact is established over a large area and thus excellent heat passage from combustion head to the outer air is secured. Each cylinder head is fitted with two inlet and two exhaust valves, whose seats form separate units and serve an additional purpose by aiding to maintain contact between the cylinder and the aluminium head.

Pistons, naturally, are of aluminium; the connecting rods are arranged, one as a master rod and the remainder eight pivoted around the big end of the master rod.

In high-powered engines of the radial type the big-ends present great difficulties. It is obvious that unless one of the main advantages of the type is to be abandoned one cannot provide as great a length of crankpin, and hence so great a bearing surface, as in the multicrank type of engine.

Therefore the loads on big-end bearings in radial engines are invariably high, and these bearings have proved a source of endless trouble in the past.

A little reflection makes it clear that the mean direction of pressure on such a bearing is from the crankshaft centre outwards through the crankpin. In the Jupiter engines the whole big-end is encircled by an outer whitemetal-lined bearing, and this bearing is carried by arms attached to bob-weights which slide in slots in the ordinary crankshaft balance-weights.

As these weights rotate they are subject to centrifugal force, and they therefore pull on the big-end and relieve the crankpin bearing of some large portion of its normal pressure, this pressure being transferred to the outer ring bearing in effect.

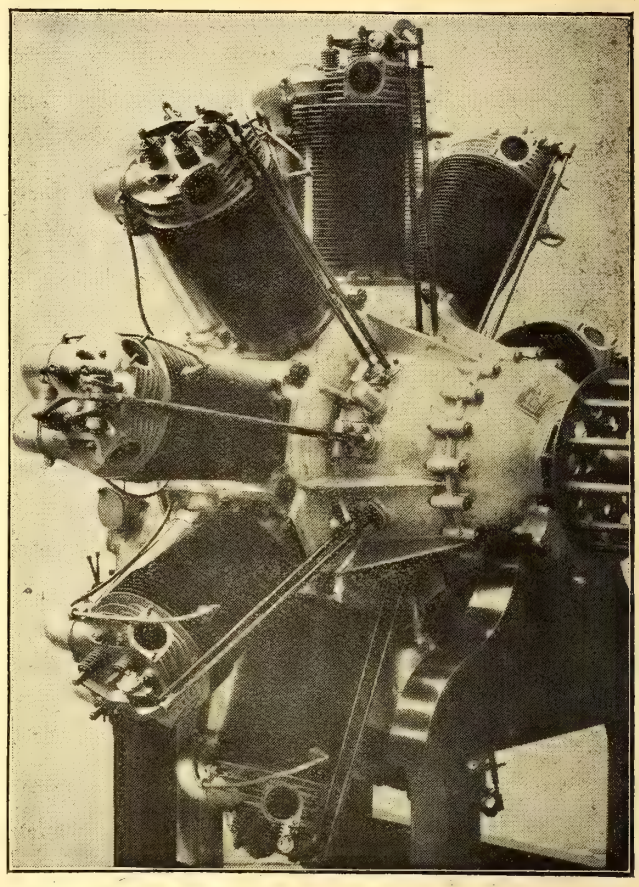
Another extremely interesting feature is the distribution system. Gas is supplied by three carburetters to a chamber at the rear of the crankcase, and radial induction pipes lead from this drum to the inlet valves.

Within the chamber is what is called a "distributor," which is in reality an aluminium ring with three deep spiral flutes in it. The pitch of each spiral corresponds to the pitch of three cylinders, and the chamber therefore is divided into three induction passages, one of which is supplied with gas by each carburetter and in turn supplies gas to three cylinders.

It is stated that the spinning motion imparted to the inflowing gases entirely prevents condensation of petrol, and that disturbance of the mixture on any one of the groups of three cylinders interferes to a minimum extent with the running of the remaining cylinders.

The "Jupiter" Mark II.

The Mark II Jupiter is identical in every way with the Mark I, except for the addition of an epicycle reduction gear carried in a housing bolted to the front of the crankcase.



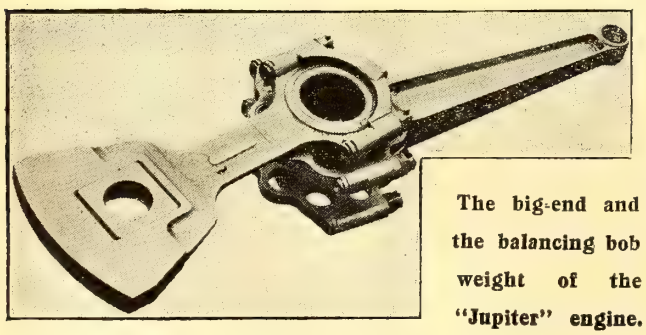
The 450-h.p. Bristol engine of the Jupiter Mark II type, showing the casing of the epicyclic reduction gear.

The "Lucifer."

The "Lucifer" incorporates the cylinder-head construction of the larger engine, but it is in every other respect very greatly simplified. It has been designed as a cheap, reliable, and hard-wearing engine for civilian purposes, and the refinements necessary to the high-power, high-performance 450-h.p. engine are unnecessary and undesirable.

Extensive tests of this type of engine have been made in the air on an Avro with very satisfactory results.

All Bristol engines are arranged to bolt onto a flat engine-plate with a large diameter registration circle, and all the auxiliaries—magnetos, oil-pumps, and the like—which project through that plate will withdraw through it without dismantling. An electric starter may be fitted to the Jupiter engines.



The big-end and the balancing bob weight of the "Jupiter" engine.

Specification.

Jupiter Mk. I.			
No. of cylinders	9	Petrol consumption lb. per h.p. hour	0.557
Bore	5.75 in.	Oil consumption lb. per h.p. hour	0.060
Stroke	7.5 in.	Weight	698 lb.
B.H.P.	450	R.P.M. (airscrew)	1,850
R.P.M. (engine)	1,850		

Specification.

Jupiter Mk. II.			
No. of cylinders	9	Petrol consumption lb. per h.p. hour	0.557
Bore	5.75 in.	Oil consumption lb. per h.p. hour	0.060
Stroke	7.5 in.	Weight	805 lb.
B.H.P.	450	R.P.M. (airscrew)	1,200
R.P.M. (engine)	1,850		

Specification.

Lucifer.			
No. of cylinders	3	Petrol consumption lb. per h.p. hour	0.557
Bore	5.75 in.	Oil consumption lb. per h.p. hour	0.025
Stroke	6.25 in.	Weight	300 lb.
B.H.P.	100		
R.P.M. (engine)	1,600		

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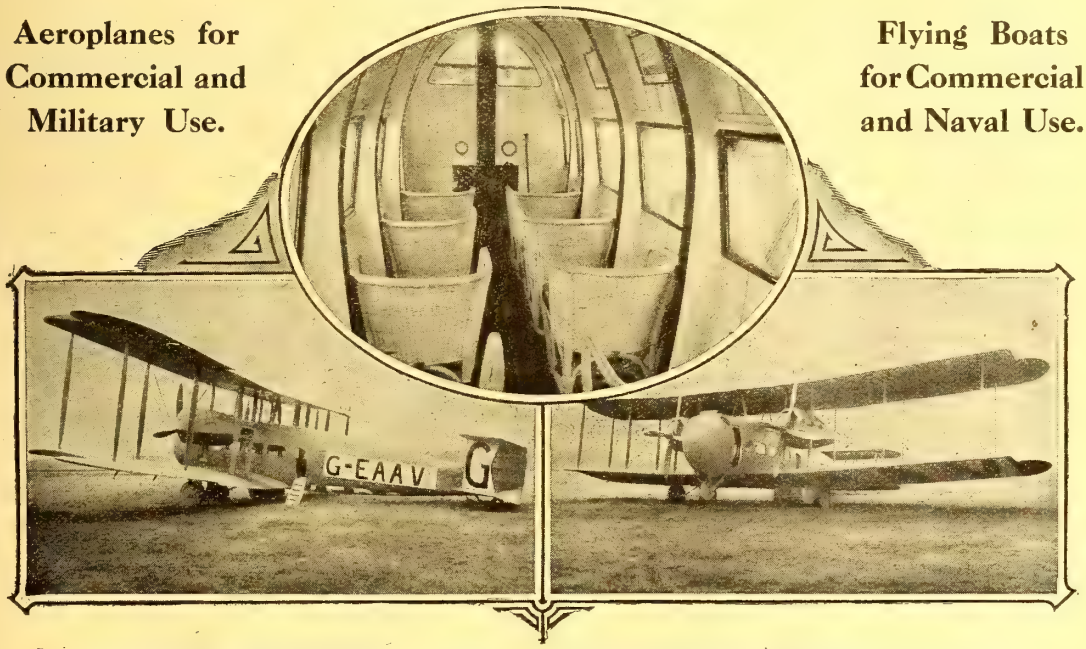

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GWYNNES, Ltd., Hammersmith.

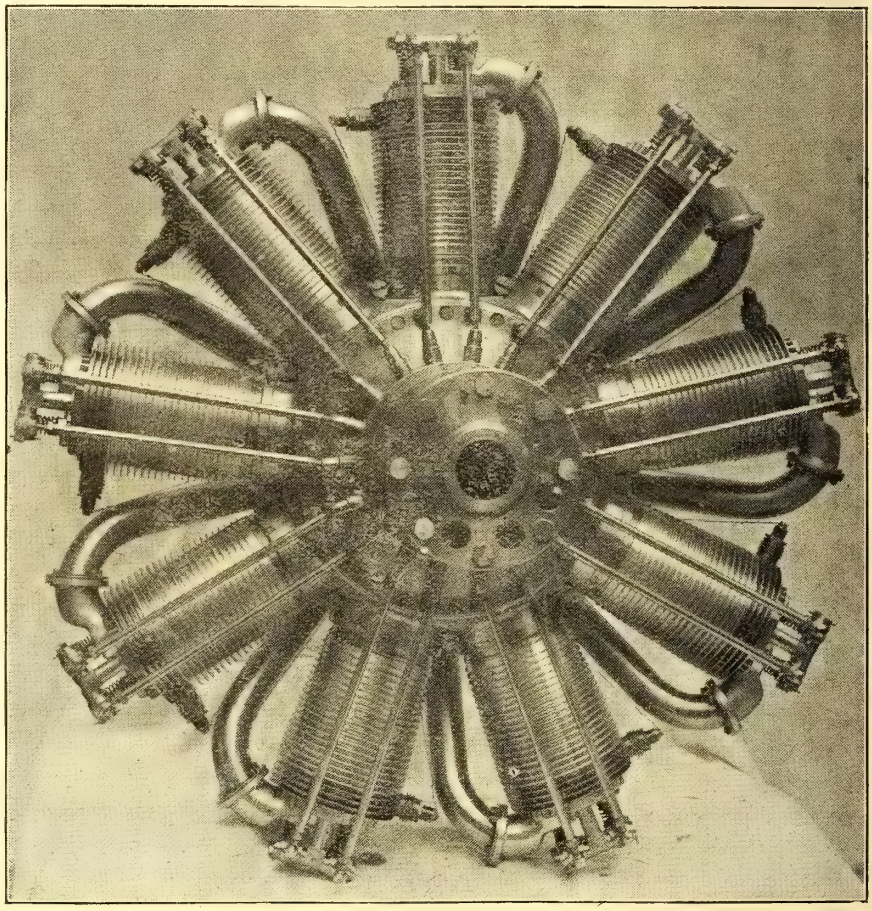
Practically throughout the war rotary engines formed the power plant of the great majority of fighting scouts. In the very early days such engines of 80 h.p. were considered adequate, these grew to 110, 150 and finally to 220 h.p., and at the very end of the struggle the 220 h.p. B.R engine was in extensive use in some of the most used machines of that class.

Of these rotaries Gwynne-built Clergets and B.R.s formed a very considerable proportion. This is not unnatural, for Gwynnes, Ltd., own the British patent rights in the Clerget, and their experience with that engine eminently fitted them to cope with the difficulties which attended the introduction of the Bentley engine, which is in many respects based on Clerget practice in its details

The Gwynne exhibit at Olympia is therefore of considerable historical interest, in that in the Clerget engines of 140 h.p. and 230 h.p. and the B.R.2 of 220 h.p., they show samples of the engines which sustained the fighters in war.

THE NEW GWYNNE-CLERGET TYPE 9Z of 100 h.p.—In the photograph the compound cylinder construction can be plainly seen. The three dark fins at the head of each cylinder, which is a separate steel component, are obviously of a different material from those on the remainder of the barrel. These barrel fins are aluminium, and enclose a steel liner. The cylinder base again shows by its darker shade that the steel of the cylinder liner proper is here exposed.

The arrangement of the induction pipes is also noticeable. All previous Clergets have been supplied with gas by oval section pipes lying immediately behind each cylinder, which would therefore not be visible in a front view such as this.



It is further of immediate interest in that it shows for the first time a new Clerget engine, designed by Gwynnes since the war for the purposes of peace—thus demonstrating that the firm do not hold that the rotary engine is now obsolete.

This, known as the type 9z, is a small and light nine-cylinder engine of 100 h.p., which it is believed will find a large sphere of employment for machines of the lighter pleasure-going type.

At first sight it would appear that the inherent inefficiency of rotary engines would rule them out for all civilian purposes, but on careful consideration it will be found that there are mitigating effects and that possibly the rotary is not so bad as it is painted.

It is true that the cylinders of a rotary develop considerably more power than ever reaches the airscrew—this excess being devoted to rotating the engine itself in the air and that consequently their fuel consumption cannot be as low as that of stationary engines delivering an equal power. They have also a tendency to be extravagant in oil, though modern rotaries have improved markedly in this respect.

But on the other hand it is possible to instal a rotary engine into a much lighter framework than will stand up under a stationary engine of equal output, and that this reflects right through the structure of the aeroplane, resulting in an altogether lighter aeroplane.

The 9z Clerget is in general design similar to the previous types of Clerget, but differs radically in its cylinder construction. The cylinder barrel is a thin steel tube over which is pressed a finned aluminium casing, and to the top whereof is screwed a steel cylinder head. The cylinder is thus lighter than the steel type, and the enormous amount of turning down necessary when fins are integral with the cylinder is avoided.

A further and immediately noticeable difference is in the arrangement of the inlet pipes. The inlet valve dome, instead of facing directly back from the cylinder head, now has its flange facing in a direction opposite to that of the engine's rotation, and the inlet pipes, instead of being concealed behind the cylinders, now emerge from the rear chamber of the crankcase midway between adjacent cylinders and bend sideways at the top to meet the inlet port.

The effect is rather as though a Clerget had been fitted with Le Rhône induction pipes.

The specimen B.R.2 engine exhibited is partly sectioned, and shows plainly the composite steel and aluminium cylinder construction, and many other of the points of its construction.

Specifications of Gwynnes' Aero Engines.

Type	Clerget 9 B.F.	Normal r.p.m.	1,250
Number of cylinders	9	Petrol, pints per h.p. hr.	0.73
Bore	120 mm.	Oil, pints h.p. hour	0.13
Stroke	172	Weight	357½ lb.
Compression ratio	5.1	Weight per h.p.	2.56 lb.
Effective h.p.	146		
Type	Clerget 11 E.B.	Normal r.p.m.	1,300
Number of cylinders	11	Petrol, pints per h.p. hr.	0.7
Bore	120 mm.	Oil, pints h.p. hour	0.1
Stroke	190	Weight	510 lb.
Compression ratio	5.1	Weight per h.p.	2.21 lb.
Effective h.p.	230		
Type	Clerget 9 Z.	Normal r.p.m.	1,300
Number of cylinders	9	Petrol, pints per h.p. hr.	0.7
Bore	105 mm.	Oil, pints h.p. hr.	0.13
Stroke	140	Weight	250 lb.
Compression ratio	5.1	Weight per h.p.	2.5 lb.
Effective h.p.	100		
Type	B.R.2	Normal r.p.m.	1,300
Number of cylinders	9	Petrol, pints per h.p. hr.	0.7
Bore	140 mm.	Oil, pints h.p. hour	0.078
Stroke	180	Weight	498 lb.
Compression ratio	5.2	Weight per h.p.	2.16 lb.
Effective h.p.	230		

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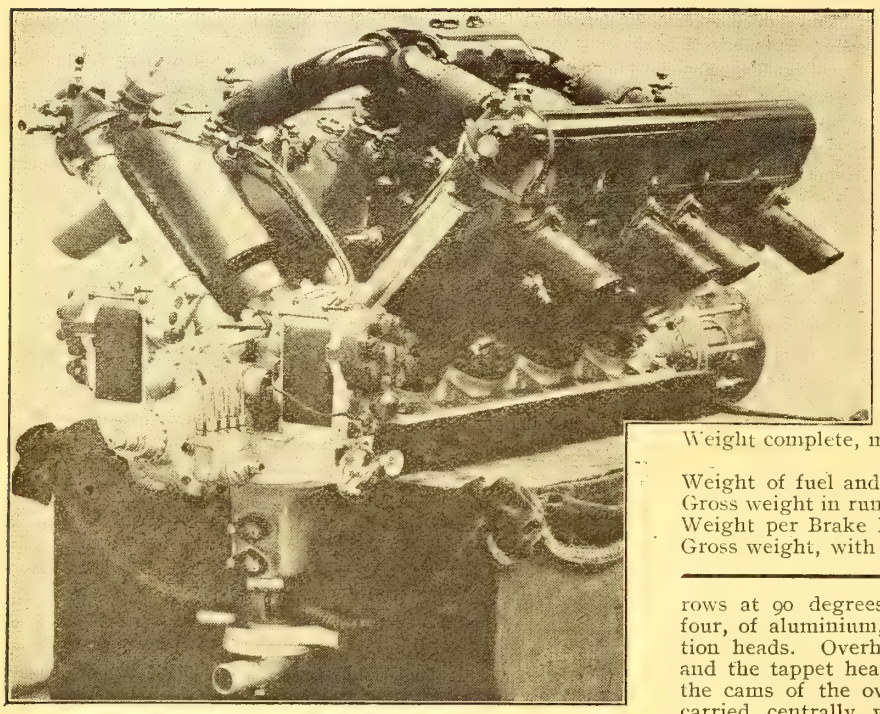
LA HISPANO-SUIZA, Rue du Capitaine Guynemeyer, Bois Colombes, Paris.



The 300-h.p. Hispano Suiza Engine.

Specification.

Bore	140 mm.
Stroke	150 mm.
Volume of 1 cylinder	2,309 cu. cm.
Compression ratio	5.3 to 1
Oil consumption	9 lb. per hr.
per B.H.P. hr.	0.026 pt.
Oil pressure	80 lb. per sq. in.
Petrol consumption	197 pt. per hr.
per B.H.P. hr.	0.64 pt.
Piston speed	1,820 ft. per min.
Mean effective pressure	117.0 at 1,850 r.p.m.
Lubrication	Scavenge and pressure pumps
Weight complete, minus water and including airscrew boss	595 lb.
Weight of fuel and oil per hour	186 lb.
Gross weight in running order, less fuel and oil	796 lb.
Weight per Brake Horse Power	2.58 lb.
Gross weight, with fuel and oil for six hours	2.024 lb.

The exhibit here is one example of the 300 h.p. Hispano-Suiza engine. This engine follows in general design the earlier well-known 150 h.p. and 200 h.p. models. It is an eight-cylinder Vee type engine, with the cylinders disposed in two rows at 90 degrees. These cylinders are cast in blocks of four, of aluminium, with screwed-in steel liners and combustion heads. Overhead valves, two per cylinder, are fitted, and the tappet head of the valve is operated on directly by the cams of the overhead camshaft. A Duplex carburetter, carried centrally within the Vee, supplies gas to the two cylinder blocks—the exhaust appearing from the outer sides.

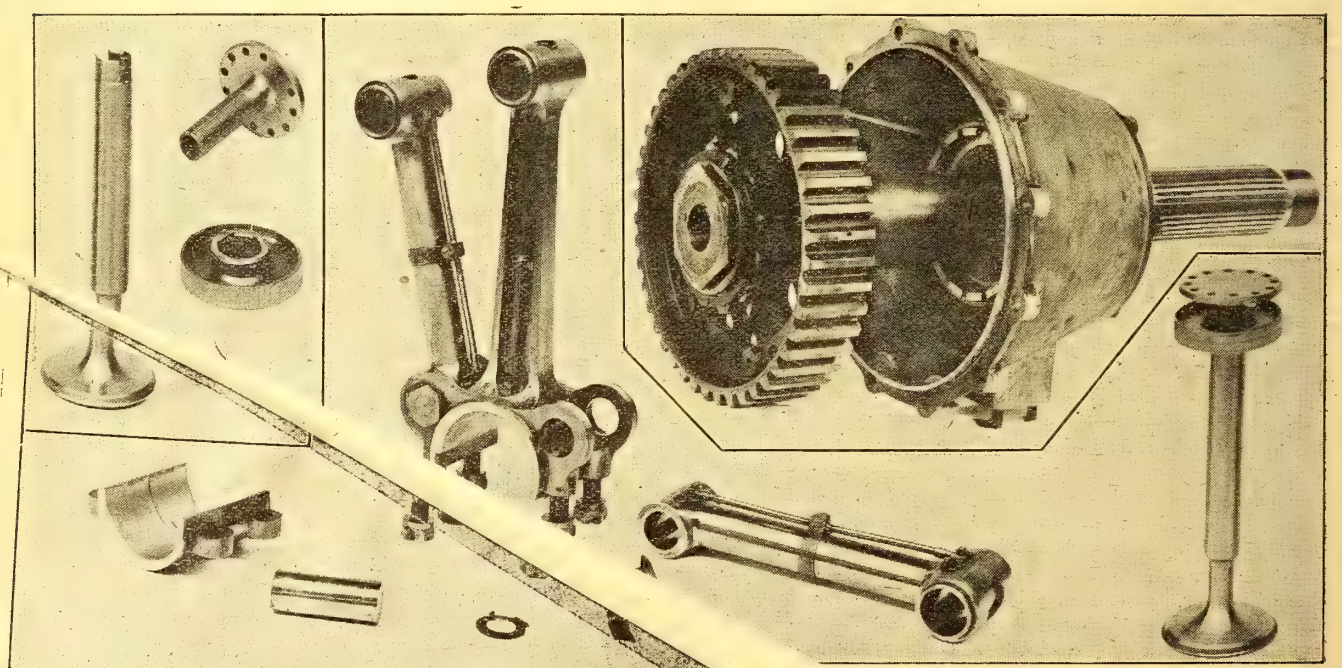
Doubled ignition, with two plugs per cylinder, is provided by two magnetos carried on cross brackets at the end away from the airscrew boss, and at this same end the oil and water pumps are carried. No details of the special features of this exhibited example can be gleaned at the stand.

D. NAPIER & SON, Ltd., 14, New Burlington Street, W.1.

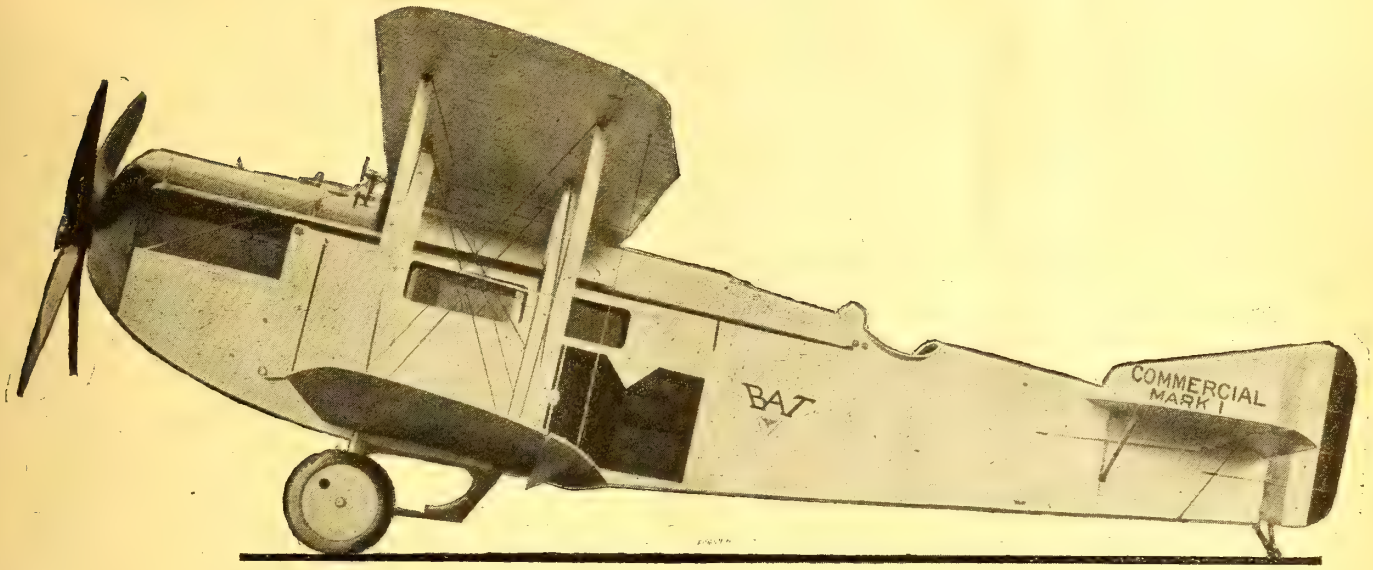
The Napier exhibit consists of two samples of the now famous Napier 450-h.p. aero-engine, sundry specimens of component parts thereof, and photographs of various aircraft whereon the said engine has demonstrated the high excellence of its qualities.

As is by now fairly well known, the Napier engine is of the twelve-cylinder type, built broad-arrow fashion—that is, it is an eight-cylinder Vee-type engine, with a third row of four cylinders interjected midway between the other two rows. The benefits of this form of construction are fairly obvious. It gives a much shorter crankcase, a stiffer and simpler crankshaft and a more compact engine than does the twelve-cylinder Vee construction, at the same time securing at least an equally uniform turning moment and excellent dynamical balance.

The Napier has but to be compared with any other existing



COMPONENTS OF THE NAPIER ENGINE.—Top left corner a valve with tappet head and locking ring dissembled. Bottom right corner a valve assembled. Top right corner the airscrew shaft, gear and gear housing. The remainder represents the connecting rods. The main rod, with its big end and one side rod are shown assembled. On the extreme left a big end cap, next a side rod pivot pin, with its lock plate and locking plug, and separately one complete side rod.



THE IDEAL COMMERCIAL AEROPLANE

As recently supplied to the INSTONE AIR LINE.

The machine here illustrated is the B.A.T.—"Commercial Mark I"—universally acknowledged to be the most practical and efficient commercial aeroplane yet produced. Although a relatively small machine—only 34 feet over-all length—it possesses surprisingly commodious cabin and cargo accommodation. Four passengers can be carried comfortably, with ample room for personal luggage, or, alternatively, parcels or mails to the extent of 1,000 lbs. in weight and **150 cubic feet in capacity.**

Here are some additional interesting points concerning the machine:—

Engine:—375 Rolls-Royce Eagle VIII.

Speed:—45-115 m.p.h.

Cabin:—Is clear of any transverse cross bracings or other obstruction, and measures 8 ft. by 3 ft. 3 in. by 6 ft.—this is a machine of 34 ft. overall length Direct entry off ground through ordinary door.

Load:—With 600 mile range oil fuel—1,000 lbs.

Fuel Cost at Full Load:—7 2 pence per mile.

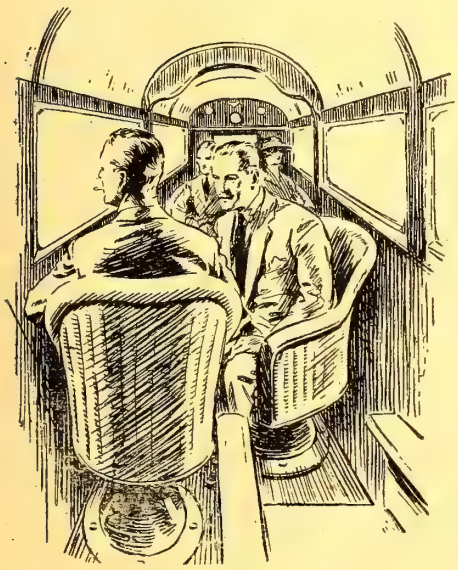
Chassis:—A sturdy job, sprung by an unique combination of oleo and rubber shock absorbers.

Tail:—Can be trimmed in flight from pilot's seat—steerable and practically unbreakable tail skid.

General Construction:—Straightforward—simple to repair and recondition.

The B.A.T. as a commercial machine has so many natural advantages, and is so moderate in first cost, that it is really the ideal machine to employ in inaugurating air transport services.

A demonstration flight can be arranged and all particulars obtained on application to;—



An impression of the interior of the cabin of the Bat Commercial.

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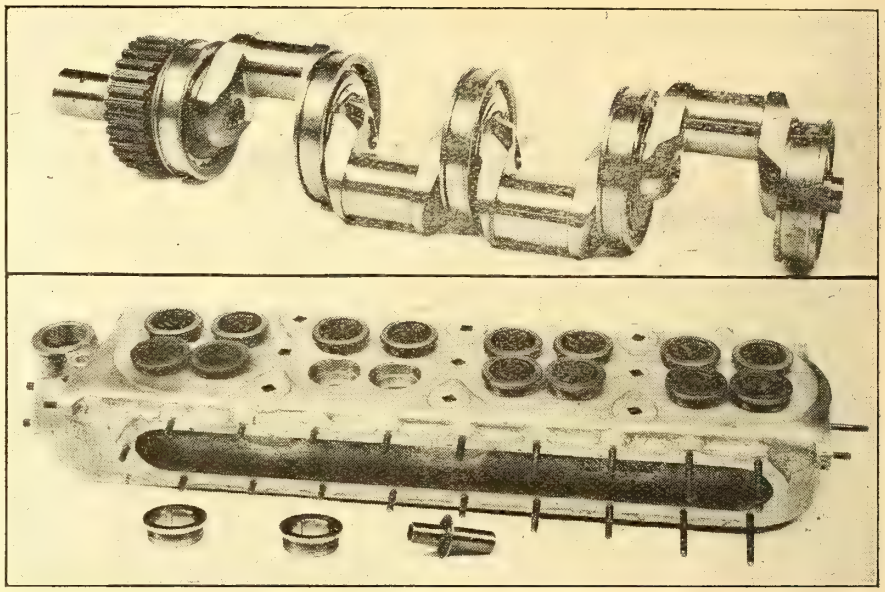
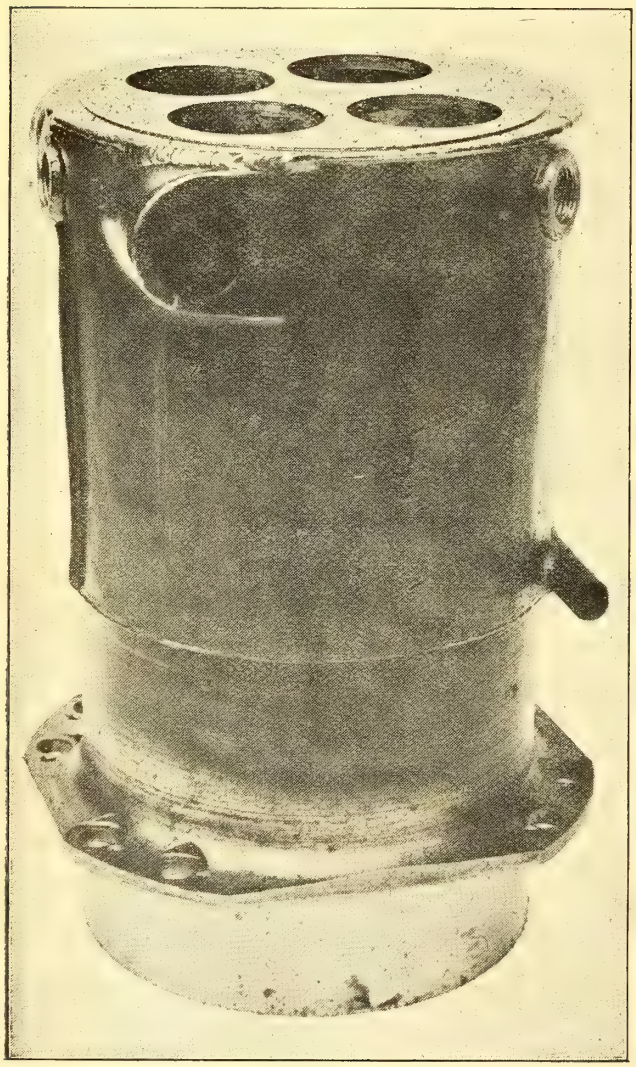


NAPIER DETAILS.—Top, the crankshaft with the airscrew drive pinion and the five roller bearings in position. Below one cylinder head removed from the cylinders. The head is inverted and there may be seen in it 14 of the 16 valve seats which secure the head to the top of the cylinders. The open channel facing the observer is the induction port. Below the head may be seen two valve seats removed, and one valve stem guide.

water-cooled engine of approximately equal power to appreciate the great saving of space which its construction allows.

Of the details of design only the more important can here be described, but a careful examination will show many other points of interest.

The cylinders are separate, each machined from a heavy steel forging, with the combustion head integral with the barrel. Top and bottom flanges turned on the cylinder have welded to them pressed sheet-steel water-jackets—these made in two halves and welded on vertical seams—each cylinder and jacket forming thus a separate unit.



One cylinder unit of the Napier engine.

These units are assembled into lines of four, held together at the crankcase in the usual method, and at their heads by the combined cylinder-head and camshaft casing which is common to all four cylinders of one row.

The head of the cylinder proper is merely a flat machined steel surface provided with orifices for the four valves and their seats. These valve seats, which are separate and replaceable units, are flanged and screwed, they are inserted from within the cylinder barrel and screw into the head casting, securing the head to the cylinders. This cylinder head is an aluminium alloy casting and contains the induction and exhaust passages. The upper surface in addition forms the lower half of the camshaft case, and carries four twin bearings for the two camshafts, the bearing for the upper end of the camshaft driving shaft, and the valve stem guides. The latter are of bronze pressed into the casting.

Of the two camshafts which are provided to each row of cylinders, one operates exhaust and the other the inlet valves, and each camshaft lies directly above the line of valves which it controls. The two camshafts are geared together by equal pinions. One of them, the inlet camshaft, is prolonged beyond these two pinions and carries at its end the bevel wheel which meshes with that on the end of the camshaft driveshaft. All the cams are formed from the solid, and the separation of exhaust and inlet valve cams renders the process of camshaft machining relatively simple

Each cam operates directly upon a flat head on the valve stem, without the interposition of rocker levers or rollers.

The valves themselves are interesting. The valve heads and a short length of the stem are of normal form, but about one valve diameter above the head, the stem diameter is increased to, roughly, one-and-a-half times the original diameter, and is bored and screwed internally. Into the screwed upper end the table whereon the cams impinge is screwed, and a rotation of this part relatively to the valve provides an adjustment of the valve clearance

To lock these two portions together and prevent continual variation in clearances, an ingenious locking device is fitted. The upper end of the valve stem is cut away on two sides and forms a pair of dogs. These fit into appropriate recesses in what is known as a locking ring—a spring steel cup which is slotted and sprung to grip tightly the edge of the tappet head and thus holds the tappet head and the valve stem from moving relatively one to the other.

Within the cylinders pistons of aluminium alloy operate. These are of very simple design, fitted with three gas rings above the gudgeon-pin and one scraper at the base of the skirt. The pistons are flat-topped, very short for their diameter, and are fitted with cast-in-steel gudgeon-pin bosses.

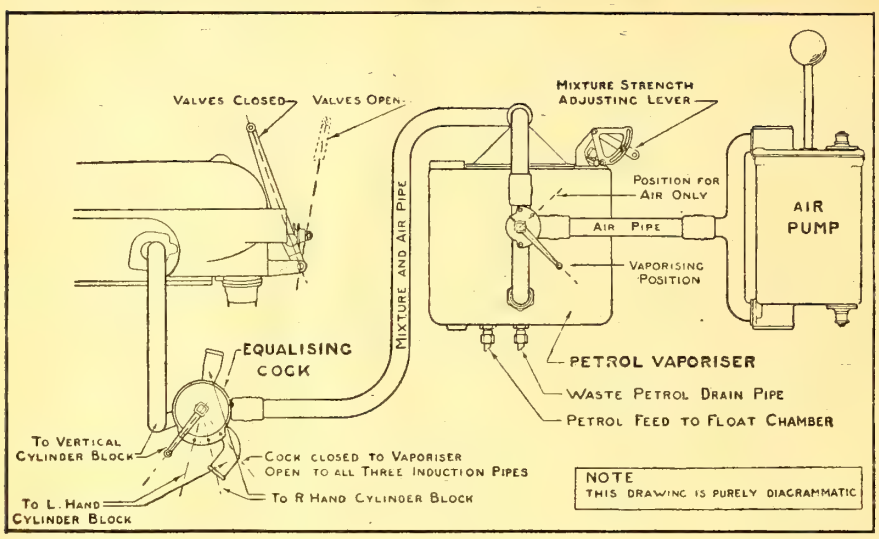
The gudgeon-pin is parallel outwardly, bored taper from each end, and held in position by a long taper-ended setscrew passing through one boss of the piston.

The corresponding cylinders in each of the three rows share one crankpin, and their impulses are directed thereto by

BEARDMORE

AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.



A DIAGRAM OF THE NAPIER GAS-STARTING SYSTEM.—Air from the pump can be diverted by the cock on the air pipe either through the vaporiser, or direct to the cylinder blocks for blowing out foul gas. The equalising cock serves in either case to connect the air supply to any one row of cylinders. The valves being opened by the valve lifter lever, first air, and then air and petrol mixture from the vaporiser is blown into each row of cylinders. A turn of the hand magneto then fires whichever cylinders may be on an explosion stroke.

articulated connecting-rods. Of these, those pertaining to the central row of cylinders are master rods, and are of channel section terminating in a big-end. This big-end is provided at each side with a pair of lugs between which the auxiliary rods from the side cylinders are hinged.

These auxiliary rods are of hollow, circular section, with both ends bushed with phosphor bronze. They are joined to the master rods by hollow taper-ended pins, screwed internally at the end opposite to the taper. The taper end fits the hole of one of the side lugs on the big-end, and a "snug" on that end prevents turning in the lug. At the other end a hexagon-headed plug screws into the pin and locks it in place.

The crankshaft is short, massive, and is hollow through all journals and crankpins. It is carried on five roller bearings, all of the packed roller type—i.e., the rollers are practically in contact and there are no cages.

Of these five the two at the extreme ends fit directly onto the crankshaft, but the intermediate three are necessarily provided with inner races of a bore sufficient to allow of their being threaded on to the shaft over the crank-throws. Hence, they are too big to fit upon the shaft itself and a split steel packing bush is therefore inserted between bearing and shaft. This bush is keyed to prevent rotation on the shaft, and is flanged to locate the bearing longitudinally.

Beyond the airscrew-end roller-bearing a taper carries the driving pinion of the reduction gear, beyond which the overhanging shaft end is parallel and runs in a bronze and white-metal bearing.

The upper crankcase is a large and somewhat complex aluminium alloy casting, with three sets of cylinder facings outwardly, and the necessary cross-ribs for the crankshaft bearings inwardly, with a housing for the airscrew shaft gear cast on to one end.

The lower bearing caps are steel straps carried by studs from the webs in the upper crankcase casting.

The airscrew shaft is supported by two roller bearings, one in the housing on the crankcase, the other on the bolted-on cover to the casing. Inwards from this roller bearing, and also carried by the casing cover, is a double-ball thrust bearing.

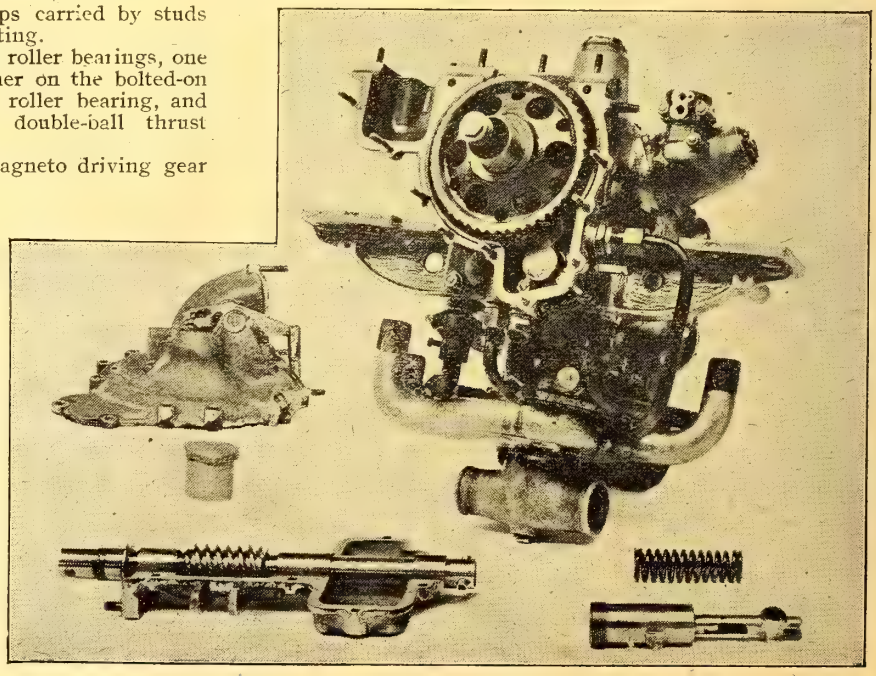
The whole of the valve, pump, and magneto driving gear is external to the crankcase proper.

The end of the crankshaft furthest away from the reduction gear projects beyond the end bearing and has applied to it an extension shaft, which it drives through dogs. This extension shaft carries two bevel wheels facing away from each other. The inner of these drives two camshaft drive-shafts parallel to the two outer cylinder axes, the vertical shaft for the centre row being driven from a bevel wheel on the left of the outer shafts, and a vertical down-going shaft which drives directly the water-pump and, by a worm and two worm-wheels, the oil-pumps.

The outer bevel drives two horizontal shafts which actuate the two twelve-cylinder magnetos. The whole of these gears, the bearings for their shafts, the oil and water pumps, and the magneto brackets form one unit, and are built into a casing formed of two aluminium castings bolted together.

Oiling is on the dry-sump principle effected by two suction pumps and two pressure pumps, all of the spur-wheel type. Oil is distributed in the usual manner through the hollow crankshaft to big-end and gudgeon-pin bearings, the splash from these serving the cylinders. A separate lead from the pressure pump delivery passes to the camshafts (also hollow), and the overflow falls back to the crankcase, passing the reduction gear casing en route.

Gas is supplied to each row of cylinders by what amounts in effect to three carburetters, one for each row. There are no induction manifolds in the ordinary sense of the term; instead each cylinder-head is fitted with an induction channel in the form of an aluminium cast trough bolted to one side of the head and extending over all the induction ports, and this trough terminates at the airscrew end in a flange whereto an induction pipe may be bolted.



THE BACK COVER UNIT OF THE NAPIER CRANKCASE.—This contains the whole of the gearing for the three camshaft drive shafts, the oil and water pumps, and the magneto drives, and carries the magnetos. The large worm-wheel, shown uncovered, meshes with the worm in the lower left-hand corner, and from one end of the wormshaft a hand-starter handle and from the other an electric starter may be used to turn the engine over.

Looking at the engine from the airscrew end, the induction pipes of the left-hand and the centre row of cylinders are on the right-hand side of their respective cylinders. That of the right-hand line is, however, on the left side of the line, and therefore between left and centre lines there is one induction pipe and between centre and right lines there are two induction pipes.

The left induction pipe is served by a single carburetter, the two right pipes are served by one double carburetter, which has a common float chamber, but entirely separate jets, choke tubes, and throttles. These carburetters are of the Claudel Hobson type, modified in structure to suit the particular application, but differing not at all in their interior economy and mode of operation from the standard Claudel carburetter. They are fitted with an altitude-control of the type wherein the air space above the petrol in the float chamber is connected to the induction pipe with an interposed and controllable air-leak

The starting of so powerful an engine requires and has received careful attention. Either a hand-turning gear or an electro-motor starting gear, or both, may be fitted to the engine.

In any case the engine is fitted with the Napier patent gas-charging gear. Essentially this consists of a valve-lifting device whereby one inlet and one exhaust valve of each cylinder may be opened at the same time, of a kind of auxiliary carburetter or "vaporiser," and of a hand air-pump whereby gas from the vaporiser may be blown through the open inlet valves to charge the cylinders.

The air-pump is a hand-operated plunger affair mounted in the pilot's cockpit, and is connected through a distributing valve to any one of the induction channels. The air delivery from the pump passes to a two-way valve, whereby, firstly, clean air may be pumped through the cylinders to scavenge out combustion products remaining there, and, secondly, air may be blown through the vaporiser to charge the cylinders with explosive mixture.

Usually, after such charging a start can be secured by turning the starting magneto; but it renders starting certain with the aid of either of the turning gears

Not only is the Napier compounded of ingenious solutions to the many problems which so powerful an engine presents, but in practice the engine has proved eminently successful in the air—and it has an unsurpassed reputation for reliability among those who have flown with it.

It is of the super-compressed type, and is not intended to be flown at full throttle at any altitude less than 8,000 feet, and though one suspects that many cases have occurred where the engine has been over-driven low down, engine breakdowns are almost unheard of with it.

It has been recorded of one Service experimental establishment that no pilot there has ever had a forced landing due to breakdown of a Napier engine.

Its first bid for fame arose through Capt. Lang's climb with a passenger to a barometer height of over 29,000 ft. At very short notice it carried Capt. Gathergood to ultimate victory in the Aerial Derby of last year, and it has since assisted at the establishment of some twenty-odd British records.

Much more to the immediate point is that on commercial services it has shown itself dependable and economical, and that its makers have ever given every possible assistance to the firms who have their engines in use.

SPECIFICATION.

No. of cylinders	12	Weight (dry)	840 lb.
Bore	$5\frac{1}{2}$ in.	Weight per b.h.p.	1.86 lb.
Stroke	$5\frac{1}{2}$ in.	Fuel consumption—	
Cylinder volume	121.8 cu. in.	Per h.p. hr.	0.496 lb.
Compression ratio	5.55/1	Per hour (full power)	223 lb.
Normal output	450 h.p.	Oil consumption—	
Normal crankshaft, full speed	2,000 r.p.m.	Per h.p. hr.	0.022 lb.
Normal airscrew speed...	1,317 r.p.m.	Per hr.	10 lb.
Gear ratio	1.57/1	Weight, complete with fuel and oil for six hr.	2,671 lb.

ROLLS-ROYCE, LTD., London.

The Rolls-Royce engines shown at Olympia form a collective exhibit of the engines which have achieved some of the greatest successes in the history of aviation.

The exhibit contains one of each of the four types of aero engines which bear the name of Rolls-Royce. These are :—

THE "HAWK," 100-H.P. 6-CYLINDER ENGINE.

From the commencement of 1918, when airships were first brought into service for spotting submarine and convoying ships, up to the time of the Armistice, no less than 36,000 miles were flown by such ships with Rolls-Royce "Hawk" engines installed. Some flights of extraordinary length stand to the credit of this engine. In one case, in August, 1918, a flight was made of 50 hours 55 minutes' duration. Other flights of from 25 to 30 hours were not uncommon.

It was also used for training pilots during the War.

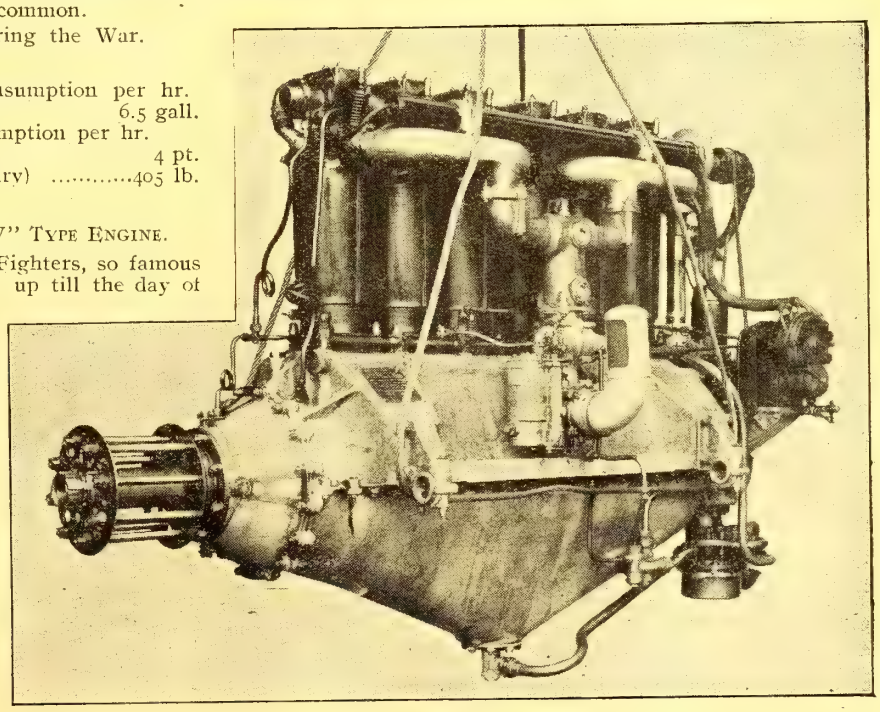
SPECIFICATION.

No. of cylinders	6	Petrol consumption per hr.	6.5 gall.
Bore	4 in.	Oil consumption per hr.	4 pt.
Stroke	6 in.	Weight (dry)	405 lb.
B.H.P.	100		
R.P.M. (engine)	1,500		
R.P.M. (airscrew)	1,500		

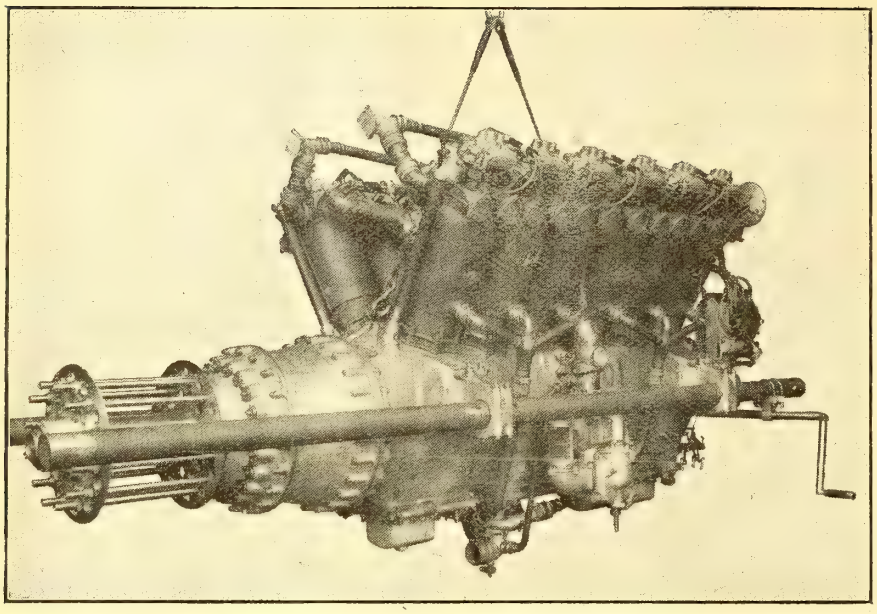
THE "FALCON" 275-H.P. 12-CYLINDER "V" TYPE ENGINE.

This is the engine used in the Bristol Fighters, so famous during the War. From August 4th, 1914, up till the day of the Armistice, November 11th, 1918, 1,524 complete Bristol Fighters had been delivered to the Air Services, and of these no less than 1,364 were equipped with Rolls-Royce 275-h.p. engines. To relate even a portion of what this engine has accomplished would take far more space than could be provided for the purpose, and the above figures must therefore be allowed to speak for themselves as an indication of the esteem in which this engine was held by the Air Ministry.

The "Falcon" engine was used for fighting purposes, in machines possessing the ability to climb rapidly to a high altitude, and to fly at great speeds. They were also used on machines which served as protecting escorts to bombing squadrons.



THE ROLLS-ROYCE SIX-CYLINDER 100-h.p. "HAWK" ENGINE. — This particular engine has not achieved to such fame as have its larger brethren of the same make. Nevertheless it has shown itself to be an engine of extreme reliability and economy, and was extensively employed during the war on airships on patrol and convoy duty. It should have distinct uses for the smaller types of civil aircraft.



THE 600-h.p. ROLLS-ROYCE "CONDOR" ENGINE.—The latest product of the Rolls aero engine department. Designed specifically for use on large flying boats for long distance patrols, reliability and economy were the chief feature sought after. It seems fairly obvious that the firm found little reason to modify the general design of their earlier engines for this purpose. Doubtless, as with other engines of this make, it will be found that with time the output will steadily increase without loss of the qualities which the engine already possesses.

To the "Falcon" stands the credit of having accomplished a journey from London to Paris in 75 minutes. This journey was made on April 8th, 1919, in a Martinsyde aeroplane, and works out at an average speed of 172 miles an hour. This appears to the fastest trip that has yet been made from London to Paris.

Specification.

No. of cylinders	12	Petrol consumption per hr.	18.5 gall.
Bore	4 in.		
Stroke	$5\frac{3}{4}$ in.	Oil consumption per hr.	6 pt.
B.H.P.	280		
R.P.M. (engine)	2,250	Weight (dry)	686 lb.
R.P.M. (airscrew)	1,327		

The "Eagle," 360-h.p. 12-Cylinder "V" Type Engine.

This famous aero-engine has made history. During the War, the "Eagle" was fitted to, amongst others, the Handley Page long-distance bombers. During the latter part of the War, up to Armistice Day, November 11th, 1918, 122 complete twin engined Handley Page bombers had been delivered to the Air Forces, and of these all but nine were equipped with Rolls-Royce "Eagle" engines.

It was one of these machines which flew from London to Constantinople, where it bombed the Turkish War Office and the *Goeben*. Another flew to Egypt, took an active part in the Palestine campaign, and subsequently went on to India. This journey was shortly afterwards accomplished by another Handley Page machine, with four Rolls-Royce 360-h.p. engines.

The "Eagle was used exclusively in the London-Paris-London air service in connection with the Peace Conference, for the conveyance of British and Allied Ministers, officials, dispatches, etc.

Since the Armistice, among the achievements standing to the credit of the "Eagle" engine are the first and only direct aeroplane flight across the Atlantic, the first and only flight from England to Australia, and the first and only flight from England to South Africa.

The Atlantic flight of 1,890 miles was accomplished in 15 hours 57 minutes, an average speed of 118 miles an hour.

The great flight to Australia, which was over a distance of roughly 11,500 miles, was accomplished in the flying time of approximately 124 hours. The machine used on this flight subsequently flew to Adelaide *via* Charleville, Sydney and Melbourne, bringing the total mileage up to approximately 16,000 miles.

To the South African flight, a distance of 6,271 miles was flown including a non-stop flight across the Mediterranean of over 14 hours' duration. These three flights were all made on Vickers "Vimy" aeroplanes.

The "Eagle" engine is now largely employed on the Continental air service in the Handley Page machines. Since September last over 65,000 miles have been covered in flights between London and Paris, and London and Brussels. Over 1,200 passengers have been carried, not including pilots, and 50,000 lb. of freight, together with about 30,000 lb. of passengers' luggage.

Specification.

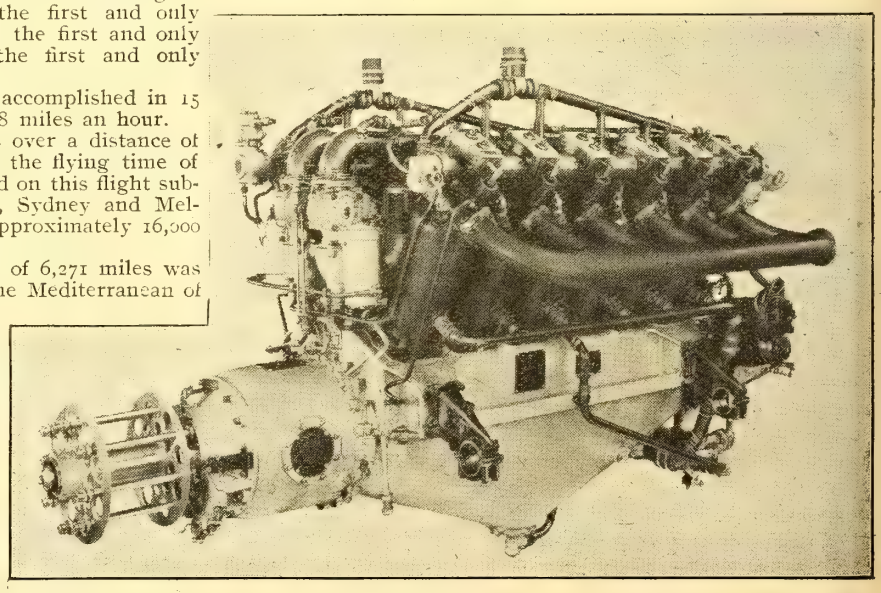
No. of cylinders	12	Petrol consumption per hr.	24 gall.
Bore	$4\frac{1}{2}$ in.		
Stroke	$6\frac{1}{2}$ in.	Oil consumption per hr.	1 gall.
B.H.P	360		
R.P.M. (engine)	1,800	Weight (dry)	900 lb.
R.P.M. (airscrew)	1,080		

The "Condor" 600-h.p. 12-Cylinder "V" Engine.

This engine, designed by Mr. Royce, is the latest development in Rolls-Royce engines It is being manufactured at the request of the Government, who realise the necessity of being pre-eminent in the air, and who require a reliable engine of this great power for carrying great weights for long distances.

Specification.

No. of cylinders	12	Petrol consumption per hr.,	39 gall.
Bore	$5\frac{1}{2}$ in.		
Stroke	$7\frac{1}{2}$ in.	Oid consumption per hr.,	1.6 gall.
B.H.P.	600		
R.P.M. (engine)	1,750	Weight (dry)	1,300 lb.
R.P.M. (airscrew)	1,167		



THE ROLLS-ROYCE "FALCON" OF 275 h.p.—This photograph should be compared with that of the "Condor" of twice the power. It can be seen that there has been little or no change in the general design since the "Falcon" was produced.

The Original NON-POISONOUS.

Titanine Dope

is strongly recommended for

PRIVATE and COMMERCIAL AEROPLANES.

Absolutely unequalled for Durability.

There is no **CONTROL** on Dope for the above types of machines.

Titanine is the most economical and offers the greatest resistance to flame.

PROMPT DELIVERIES.

Complete Doping Schemes submitted on application.

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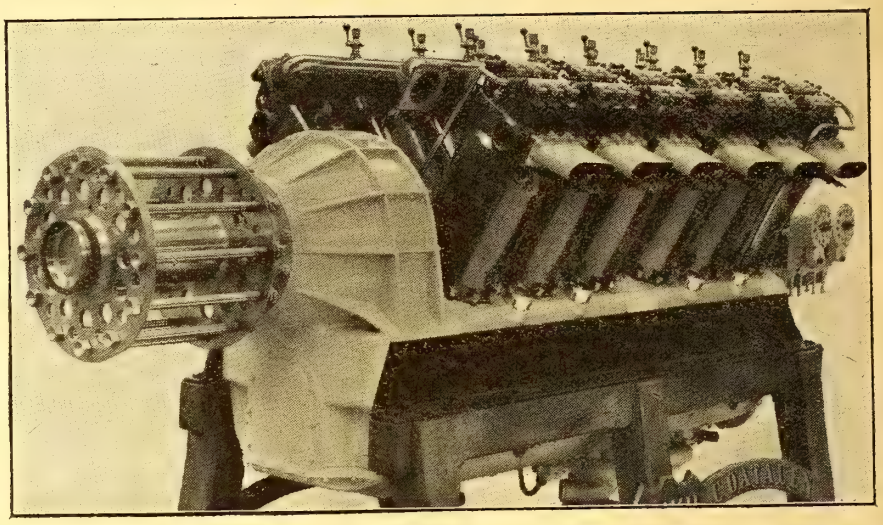
THE SUNBEAM MOTOR CAR CO., LTD.

THE LARGEST ENGINE AT OLYMPIA.—The Sunbeam Sikh of 800-900 h.p. The colossal airscrew boss indicates in some measure the power of this unit. This engine and its brother the six-cylinder "Sikh" differ from all the other Sunbeam engines exhibited in that they have separate cylinders with steel sheet jackets. The "Sikh" engines have been designed specially with a view to high economy and great reliability, and should do well in commercial service.



The stand of the Sunbeam Motor Car Co., Ltd., must be accounted the most complete aero engine exhibit at Olympia. It is true that one other engine maker shows an engine of smaller power than the Sunbeam "Dyak," but there is none whose range extends so far up the scale as the 800-900 h.p. "Sikh."

And between these two extremes the Sunbeam Company show six engines of graded output.

Though the number of engines is large, they are highly standardised as to design, and with the exceptions noted all are of the same general description.

The past aerial services of Sunbeam engines and the robust and workmanlike appearance of the present specimens render it unnecessary to dilate further upon their excellence.

Materials.

All these engines are composed of similar materials for similar parts. For instance, the crankshafts and the connecting rods in each case are of nickel chrome steel, and the pistons are of aluminium. The cylinders, with the exceptions mentioned below, are all of aluminium casting, with steel liners and bronze valve seats. The exceptions to this are the two "Sikh" engines, in which the cylinders are composed entirely of steel, welded together with their jackets, and the "Maori" and "Cossack" engines, in which the cylinder blocks are of cast iron. In all the engines the valves are made of high chrome steel of a special form, so as to withstand heat and prevent distortion, thus allowing the machines to run for long periods without overhaul. The crankcases are of aluminium and are of patented design, which will be found to give greater strength and allow the bearing caps to take a large share of the side load imposed on the crankshaft under the usual working stresses. The valve gearing is of self-hardened nickel chrome steel.

Cooling.

All the engines are of the water-cooled type, the circulation being in each case by centrifugal pump. The water passages are of very large area, and as the pumps are designed to give a specially large output, the size of the radiator required is correspondingly reduced.

Lubrication.

Lubrication in all types is on the "dry base" principle, and is by gearwheel pumps, three pumps being fitted to each engine, namely, (1) the scavenger pump, which draws the oil from the sump and returns it to the oil tank, which must form an integral part of the installation; (2) the main force pump, which lubricates the main bearings with cooled oil direct from the oil tank; (3) the auxiliary oil circuit pump, which forms a portion of the main force pump, and is arranged to deliver the necessary quantity of oil at a very low pressure to the camshaft bearings, and all auxiliary bearings of the engine.

Carburation.

Carburation is effected by Claudel-Hobson carburetters of diffuser type, arranged as standard to work under a head or pressure of 4 lb. per sq. in. Variations of pressure can be obtained by altering the design of the float feed, if necessary. An air pump for supplying air at 4 lb. per sq. in. for lifting petrol in service tanks is fitted as standard when required.

Ignition.

Ignition is in all cases by means of high-tension magnetos. The magnetos are driven by a coupling formed of laminated spring blades which gives great flexibility to the drive, and assures a longer life for the magneto itself. Two sparking plugs per cylinder are provided on all the engines except those of the "Sikh" type, which have four plugs per cylinder.

Direction of Rotation.

The rotation of all the engines is clockwise when viewed from the timing end (R.H.). Arrangements can, however, be made, when ordering, for the engines to run in an anti-clockwise direction.

The "Dyak" 100 h.p. Engine.

This engine is of the vertical type, having six cylinders in one row and cast *en bloc*. The valves, of which there are two to each cylinder, are operated by one overhead camshaft. This is driven by bevel gearing from the crankshaft, through a vertical shaft. The connecting rods are of "H" section, and of extreme lightness combined with sufficient strength and rigidity.

The hollow crankshaft is carried by seven die-cast white metal bearings, and the airscrew is mounted direct onto the crankshaft, which is fitted with a thrust bearing for the purpose of taking up the thrust of the propeller.

Specification.

Bore .....4.724 in.	Weight of engine complete without water, fuel, oil, or hand starter gear ..... 399 lb.
Stroke .....5.118 in.	
Total stroke vol. of cylinders 538.26 cu. in.	Weight of engine in running order without fuel, oil, or hand starter gear... 439 lb.
Piston area .....17.53 sq. in.	
Normal b.h.p. ..... 100 at 1,200 r.p.m.	Weight of engine in running order, with fuel and oil for 6 hours .....745 lb.
Ascertained fuel consumption 0.54 pt. per b.h.p. hr.	
Firing sequence of cylinders from timing end 1, 5, 3, 6, 2, 4	

The "Arab" 200 h.p. Engine.

This engine is designed for high-speed aeroplanes. It is of the "V" type, having eight cylinders cast in two blocks of four each, the blocks being disposed on the crankchamber at an angle of 90 degrees. The pistons are of aluminium, fitted with three gas rings and one scraper ring. The valves are three to each cylinder, one large inlet valve and two exhaust valves. These are actuated by two overhead camshafts driven by means of bevel gear from the crankshaft through intermediate shafts. The connecting rods are of the articulated pattern, the rods themselves being of "H" section. The hollow crankshaft is carried by five die-cast white metal bearings, and the propeller is mounted direct onto the crankshaft. This engine may be adapted either for hand or electric starter.

Specification.

Bore .....4.724 in.	Weight of engine complete without water, fuel or oil 517 lb.
Stroke .....5.118 in.	
Total stroke vol. of cylinders 717.65 cu. in.	Weight of engine in running order without fuel or oil .....562 lb.
Piston area .....17.53 sq. in.	
B.H.P. at 1,600 r.p.m. 200	
B.H.P. at 2,000 r.p.m. 240	Weight of engine in running order with fuel and oil for 6 hours .....1,193 lb.
Ascertained fuel consumption 0.54 pt. per b.h.p. hr.	
Firing sequence from timing end 1, 1A, 2, 2A, 4, 4A, 3, 3A	

The "Manitou" 300 h.p. Aircraft Engine.

This engine is suitable for aviation purposes of all kinds, including aeroplanes, seaplanes, and large and small airships.

Unsurpassed reputation for reliability,

B.T.H. Magnetos

helped create the following British Records:—

The first airship to cross the Atlantic, Naval Airship R.34.

First and second prizes—Aerial Derby, 1919.

British altitude record—30,500 feet.

First non-stop London-Madrid flight.

British record for a closed circuit.

Eighteen new British speed flying records.

British record for useful load carried, duration and height—3,690 lb., 1 hour 20 mins., 13,999 ft.

The British Thomson-Houston Co., Ltd.,
Lower Ford Street, Coventry, England.
Member of the British Ignition Apparatus Association.

It consists of 12 cylinders cast in blocks of three, and disposed upon the crankcase in two rows of six cylinders each, the rows being inclined to each other at an angle of 60 degrees. The valves, two inlet and two exhaust, are of the overhead pattern, and are actuated by overhead camshafts driven from the crankshaft by trains of spur gears.

The connecting rods are articulated, the rods themselves being of "H" section and the hollow crankshaft is carried by eight die-cast white metal bearings.

The propeller is driven indirectly by gearing to the propeller shaft which, with the thrust bearing, is mounted on an extension of the crankcase, cast on the engine.

Carburation is by means of two Claudel-Hobson carburetters (H.C.7) set in the centre of the "V" formed by the cylinder blocks, and arranged for gravity feed.

Ignition is by means of two B.T.H. (A.V.12 type) magnetos, one having a clockwise, and the other an anti-clockwise direction of rotation. Both electric and hand starters are fitted to this engine.

Specification.

Bore .....4.331 in.	Ratio of reduction gear ... 1.57 to 1
Stroke .....5.315 in.	Weight of engine complete without water, fuel or oil 845 lb.
Total stroke vol. of cylinders 939.47 cu. in.	Weight of engine in running order without fuel or oil .....904 lb.
Piston area .....14.73 sq. in.	Weight of engine in running order with fuel and oil for 6 hours ...1,838 lb.
Normal b.h.p. ..... 300 at 2,000 r.p.m.	
Fuel consumption ..... 0.54 pt. per b.h.p. hr.	
Firing sequence ...1, 1A, 5, 5A, 3, 3A, 6, 6A, 2, 2A, 4, 4A	

The "Matabele" 400 h.p. Engine.

This engine is designed to suit all kinds of aircraft, including aeroplanes, seaplanes and large and small airships. It has 12 cylinders cast in blocks of three and disposed upon the crankcase in two rows of six cylinders each, the rows being inclined to each other at an angle of 60 degrees. Pistons are of aluminium, with connecting rods of the articulated pattern, and of "H" section. The valves are overhead and are four in number to each cylinder, two inlets and two exhausts. They are actuated by overhead camshafts driven from the crankshaft by trains of gears. The crankshaft is carried by eight die-cast, white metal bearings.

The airscrew is driven indirectly by gearing. The airscrew shaft, with the thrust bearing, is mounted on an extension of the crankcase.

Carburation is by means of two Claudel-Hobson twin type H.C.7 carburetters set in the centre of the "V" formed by the cylinder blocks, and arranged for gravity feed. Ignition is by means of four P.M.6 magnetos, two having a clockwise, and the remaining two an anti-clockwise direction of rotation. Both compressed air and hand starters are fitted to this engine.

Specification.

Bore of cylinders ...4.803 in.	Firing sequence ...1, 1A, 5, 5A, 3, 3A, 6, 6A, 2, 2A, 4, 4A
Stroke of cylinders ...6.299 in.	Weight of engine complete without water fuel or oil 1,000 lb.
Total stroke vol. of cylinders 1368.7 cu. in.	Weight of engine in running order without fuel and oil .....1,091 lb.
Piston area .....18.1 sq. in.	Weigh of engine in running order with fuel and oil for 6 hours ...2,548.7 lb.
Normal b.h.p. ..... 420 at 2,000 r.p.m.	
Speed of propeller ..... 1,225 r.p.m.	
Fuel consumption ..... 0.54 pt. per b.h.p. hr.	

The "Sikh" 800-900 h.p. Engine.

This engine is suitable for use on airships, large aeroplanes and seaplanes. It has 12 separate steel cylinders machined all over, and disposed upon the crankcase in two rows of six cylinders each, the rows being inclined to each other at an angle of 60 degrees. Any one cylinder can be easily removed without affecting the timing of the engine. The pistons are of aluminium, and the connecting rods are of forked pattern and of "H" section.

The valves, three inlet and three exhaust to each cylinder, are of the overhead type, and are actuated by push rods and rockers, the single central camshaft being housed within the crankcase at the base of the "V," and driven by gearwheel direct from the crankshaft. A feature of the design is the accessibility of the cam gear, it being only necessary to remove the cover at the timing end to enable the camshaft to be drawn out clear of the engine.

The hollow crankshaft is carried by eight die-cast white metal bearings, and lubrication of these and the other working parts is by the compound pressure system already described.

The airscrew shaft is driven indirectly by spur gears. The airscrew shaft, with the thrust bearing, is mounted on an extension of the crankcase.

Carburation is by four Sunbeam-Claudel carburetters of special type, two at each end of the engine.

Ignition is provided by four 12 cylinder magnetos driven by skew gear and fitted with vernier type coupling to allow of fine adjustment. Two of these magnetos have a clockwise, and the remaining two an anti-clockwise, direction of rotation.

Both hand and electric starters are fitted to this engine.

Specification.

Bore of cylinders ...7.086 in.	main engine details; 10 lb. per sq. in. to auxiliary details
Stroke of cylinders 8.268 in.	Firing sequence of cylinders 1, 1A, 5, 5A, 3, 3A, 6, 6A, 2, 2A, 4, 4A
Total stroke vol. of cylinders 4033.2 cu. in	Direction of rotation of revolution counter drive viewed from driving end of spindle ...Anti-clockwise
Normal b.h.p. ..... 850 at 1,400 r.p.m.	Weight of engine complete without fuel, water or oil 1,952 lb.
Direction of rotation of propeller ...Clockwise when ...viewed from propeller end	
Normal speed of propeller 920 r.p.m	
Oil pressure recommended 40 lb. per. sq. in. to	

The "Sikh" 400-450 h.p. Engine.

This engine is a six-cylinder version of the 12-cylinder "Sikh," and of only half the power. It is suitable for use on airships and large aeroplanes. In all its components it is exactly similar to its larger brother.

For cases where the simplest and most accessible engine possible of so large a power is essential, this particular engine should have great uses. There is no other six-cylinder engine in existence giving over 400 h.p., and it seems highly probable that the demands of the airship designer have been responsible for its existence.

Specification.

Bore of cylinders ...7.086 in.	Firing sequence of cylinders 1, 5, 3, 6, 2, 4
Stroke of cylinders ...8.268 in.	Direction of rotation of revolution counter drive viewed from driving end of spindle ...Anti-clockwise
Total stroke vol. of cylinders 2016.6 cu. in	Speed of revolution counter drive ...One quarter engine speed
Normal b.h.p. and speed... 425 at 1,400 r.p.m.	
Oil pressure recommended... 40 lb. per sq. in. to main engine details; 10 lb. per sq. in. to auxiliary details	

THE ZEITLIN ENGINE.

At first sight, and particularly from the airscrew end, the Zeitlin engine bears a very great resemblance to the old nine-cylinder Monosoupape Gnôme

Inquiry elicits the fact that this resemblance goes deeper than mere appearances and that the engine in fact operates on the same basic principles.

It is of the single-valve, four-stroke cycle type, and as in the Mono, a rich mixture in the crankcase is admitted to the cylinders through ports uncovered by the piston at the end of the exhaust stroke, and this mixture there combines with air admitted through the exhaust valve—which remains open after the end of the exhaust.

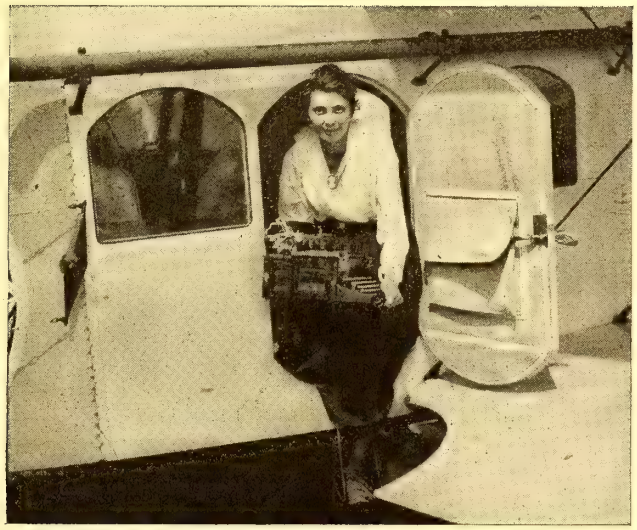
But—and it is an important but—although the mixture-filled crankcase is in communication with the working cylinder through these ports, the ports are not uncovered by the piston at the end of the explosion stroke—which immediately does away with the risk of a fire-back to the carburetter if the engine is starved of petrol.

This is due to the fact that the pistons have a variable travel, and this variable travel is used to secure other advantages. For instance, on the exhaust stroke the piston travels practically to the cylinder head and thoroughly sweeps out the products of combustion. On the induction stroke the piston moves from the very top of the cylinder to below the induction ports and secures a very complete cylinder charge. The compression stroke does not reach to the top of the cylinder, but instead leaves an adequate compression clearance, and on the explosion stroke the piston stops short of the inlet ports.

This variable stroke is secured by mounting the big-end of each connecting rod upon an eccentric which is caused to rotate upon the crankpin in the same direction as the engine itself and at half the engine speed, and thus produces the effect of a crank of variable throw.

Each connecting-rod demands a separate eccentric: thus a master big-end with articulated auxiliaries cannot be used, and therefore in the Zeitlin engine each rod has its own big-end arranged side by side on a rather elongated crankpin. Directly upon the crankpin is mounted a long phosphor-bronze bush, and upon the airscrew end thereof a pinion. This pinion has upon its face a series of driving dogs, and these engage

WESTLAND



The comfort and steadiness of the **WESTLAND LIMOUSINE** is emphasised by the above picture.

The Typist is just alighting from the aeroplane with her typewriter after an aerial trip.

The **LIMOUSINE** is quiet enough and steady enough to enable one to talk and write without difficulty while in flight.

We are ready to quote for passenger trips to anywhere in England or on the Continent from our Aerodrome at Yeovil.

For full particulars and arrangements as to trial flights apply to the

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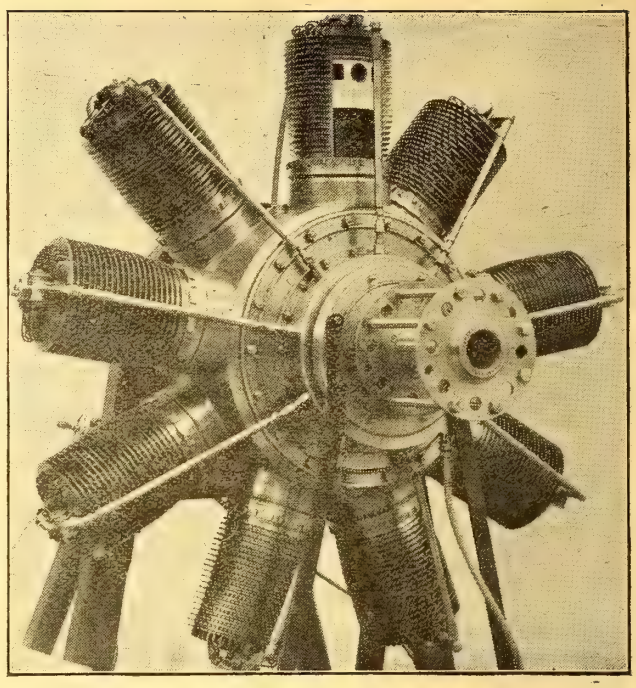
with recesses cut into one of the big-end eccentrics, which in turn engages by similar dogs the next eccentric and so on through all the nine. These eccentrics form the inner race of a packed roller bearing, the outer race whereof is the big-end of one connecting rod. The pinion at the end of the row of eccentrics engages with an internally-toothed ring which also engages with a central wheel fixed to the crankcase, and imparts the required rotation to the interlocked big-end eccentrics. It is to be noted that, owing to this rotation of the eccentric inner race, the rolling speed of the roller-bearing big-ends are reduced to one-half of that of an ordinary big-end. The side-by-side big-ends necessitate the staggering of the cylinders on the crankcase, but the increased overall length of crankcase thus necessary is slight. The cylinders are of the normal rotary type, with fins and cylinder-head machined from a steel forging. The exhaust valve is central in that head, but is of unusual form. The exhaust port is annular, and through the central blocked-out portion of the port the sparking-plug is fitted. The valve itself is a flat ring with a stiffening flange projecting upward through the annular port, so that the section through this ring takes the form of an inverted T These valves are operated through rocker arms and push rods in the normal manner.

The actual valve gearing is novel. The nine valves are operated by three cams on a common sleeve which is driven by an epicyclic train of gears at one-half engine speed, and in the same direction as the engine. Each cam operates three of the valves, the cams driving onto the tappet rod through the intermediary of pivoted rocking fingers. These rocking fingers are prolonged beyond their pivots in the form of bell



The 220-h.p. Zeitlin Rotary.

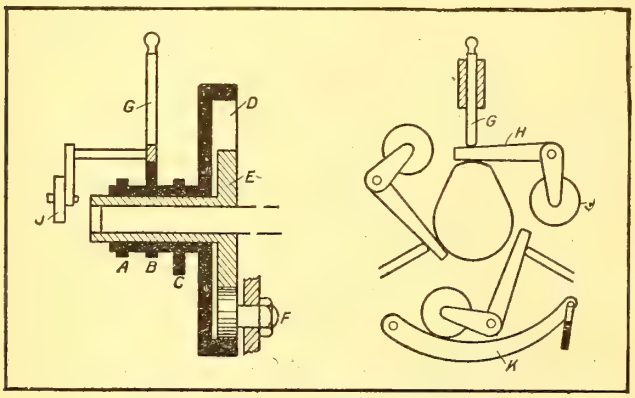


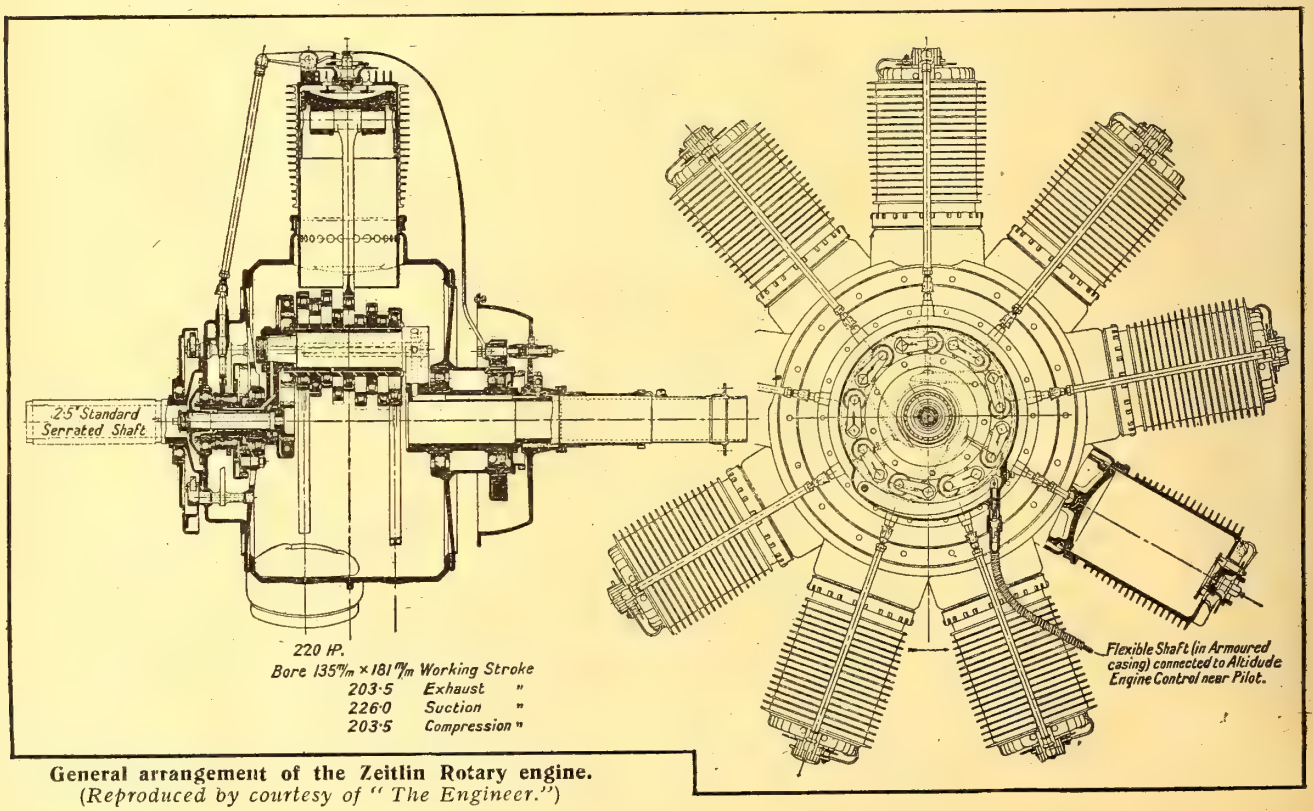
Diagram of the Zeitlin altitude control.
(Reproduced by courtesy of "The Engineer.")

cranks carrying at their ends rollers, which at ordinary altitudes impinge upon a fixed cam, which is carried by a stationary box entirely separated from the crankcase, mounted on the engine nose-piece in ball-bearings.

This fixed cam is pivoted at one end and movable about the pivot by a control cable. The effect of these rollers impinging on the cam is to open the exhaust valve of each cylinder at the bottom of the compression stroke, and the extent to which it is kept open is determined by the position of this cam.

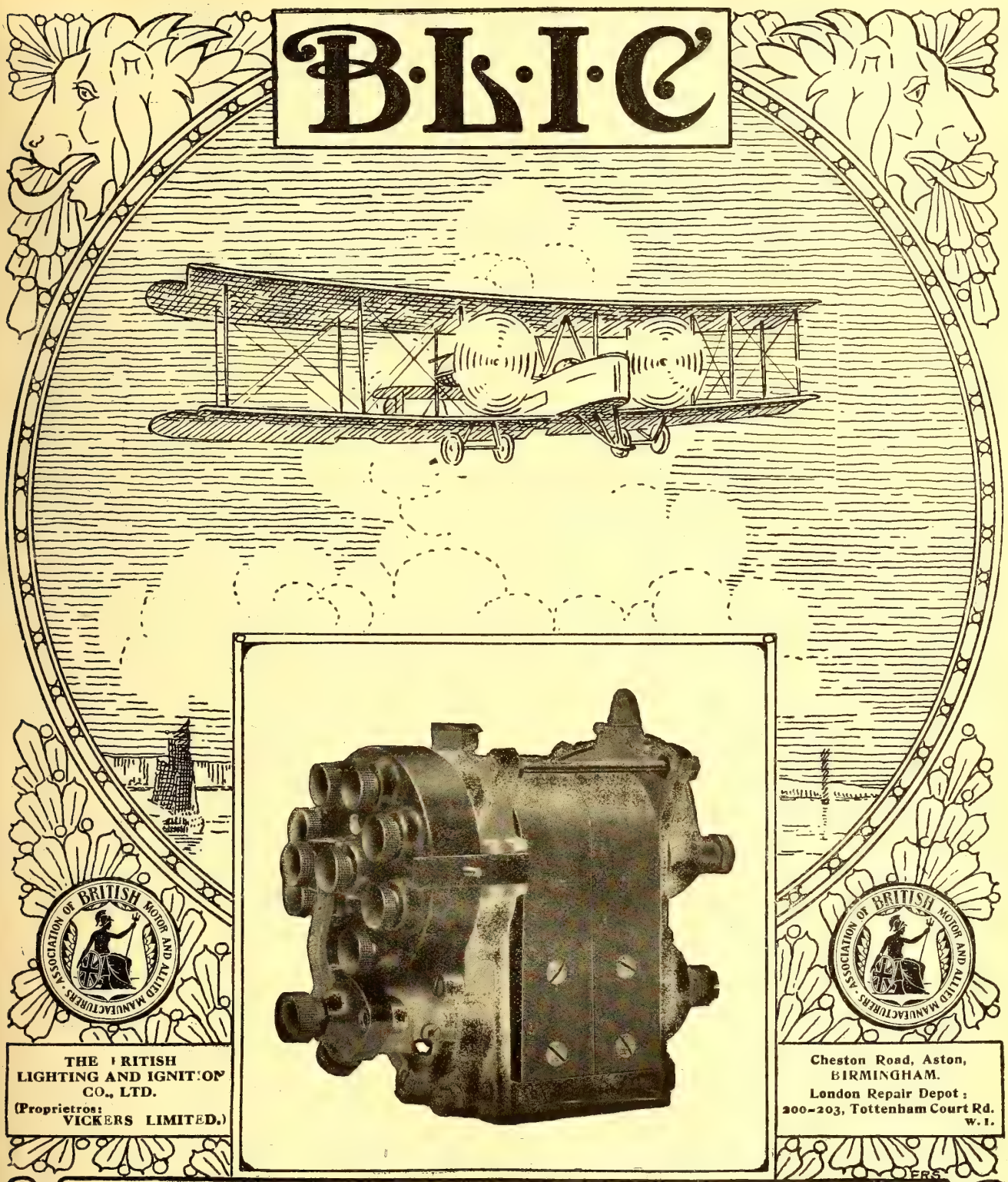
The engine is designed so that, operating under the atmospheric conditions equivalent to a height of 12,000 ft., and with this cam not in action, the full charge of air taken through the exhaust valve and of petrol from the crankcase produces a mixture and gives a compression which allows the engine to develop its full power.

At lower altitudes this mixture would be too weak and the compression too high for satisfactory running.



General arrangement of the Zeitlin Rotary engine.
(Reproduced by courtesy of "The Engineer.")

B·L·I·C



THE BRITISH LIGHTING AND IGNITION CO., LTD.
(Proprietors: VICKERS LIMITED.)

Cheston Road, Aston, BIRMINGHAM.
London Repair Depot: 200-203, Tottenham Court Rd. W.1.

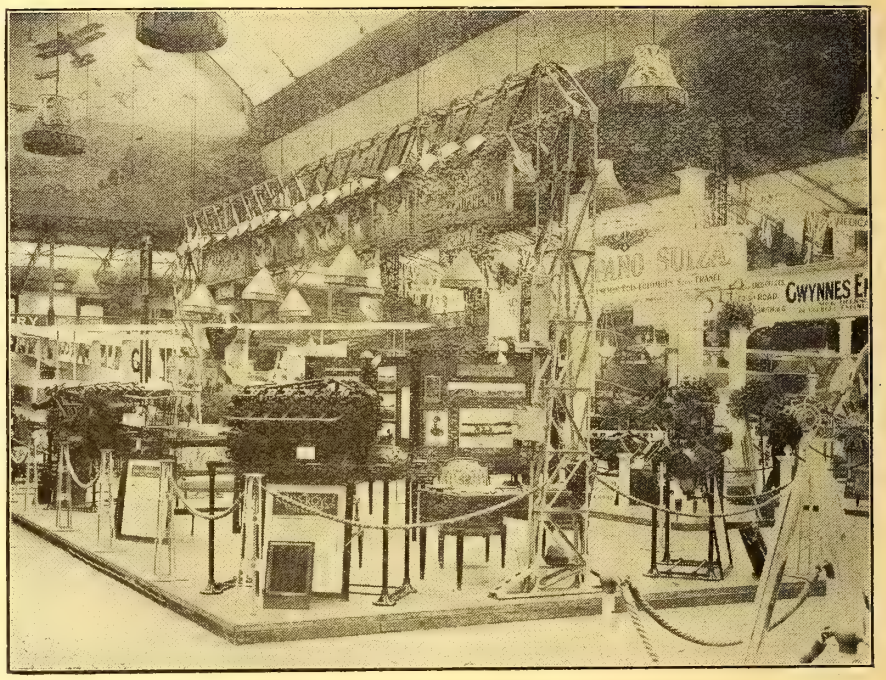
THE British-built "B.L.I.C." Magnetos are a perfect combination of scientific design and engineering skill. Although absolutely dustproof and waterproof, all parts are easily accessible for attention.

The principle of construction makes them not only reliable, but also noiseless and compact. There are no bare external contacts.

Write us for Catalogue.

By putting this altitude control cam into operation, some of the clear air at the top of the cylinder is expelled, and a richer mixture is obtained, and the compression is effectively reduced. In the extreme position of this altitude control it serves as a decompressor and gives easy starting. Over its range of running positions it provides a compression ratio varying from 4.5/1 at ground level to 7/1 at 12,000 ft. If the designers succeed in overcoming the existing prejudices against rotary engines, and can demonstrate that their type does not need the constant overhauling usually associated with the type, the Zeitlin engine in this form should have many uses in the future.

If, however, it proves impossible to obtain a rotary engine free from the drawbacks of the type, there seems no insuperable difficulty in adapting the essential features of a variable stroke and the variable compression to other types of engine—at least, to the radial type.



THE ROLLS-ROYCE STAND.—The nearest engine is the "Falcon," the little 100-h.p. "Hawk" is on the extreme right; on the left is the "Eagle," famous as the engine of the Vickers-Vimy on all its world-crossing flights. The 600-h.p. Condor is lurking behind the stand decorations in the farthest corner.

ACCESSORIES AT OLYMPIA.

1. George Kent, Ltd., 199, High Holborn, London, W.C.1, showed an ingenious type of circular rotating wind-screen for car or aeroplane. It is worked by a helix, the tips of which only exist, and the action of travelling fast through the air rotates this (or it can be power-driven for slower vehicles). The rain is then slung off by centrifugal force as the screen spins, and so a clear vision is maintained much in the same way as, when the Chief of the Air Staff spins, the inefficient members of the Air Force staff are "slung out" and so the vision of the Air Ministry is cleared.

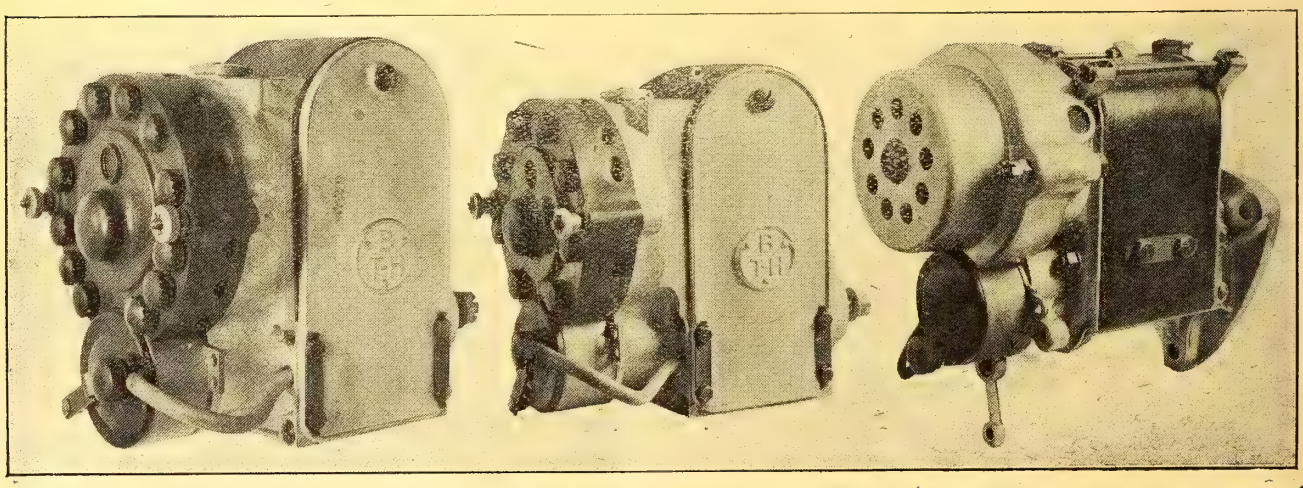
3. The Vacuum Oil Company, Ltd., Caxton House, Westminster, showed specimens and tins of their famous Gargoyle Mobiloils. This oil is too well known to need describing.

4. Aerofilms, Ltd., The London Aerodrome, Hendon, London, N.W.9, showed an excellent series of aerial photographs of towns and other objects of interest throughout England.

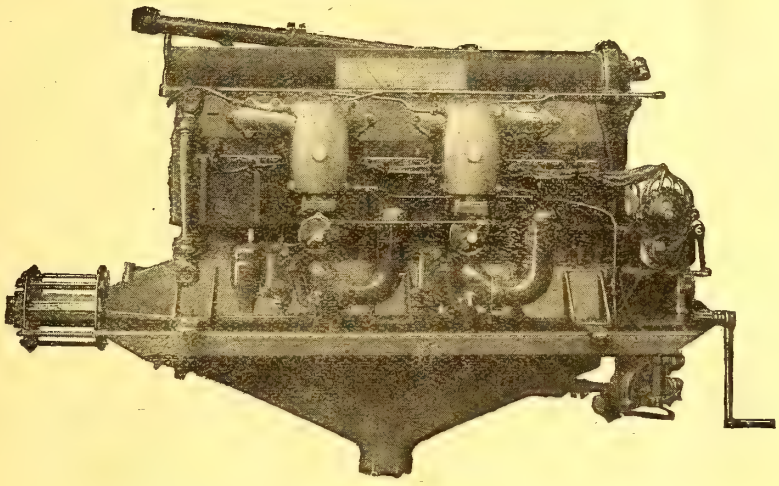
5. Prices Co., Ltd., Battersea, London, S.W.11, showed samples of their various lubrication preparations, including the well-known "Motorine."

6. The British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry, and of Rugby, showed various specimens of magnetos and parts, including their exclusive designs for eight, nine, and twelve cylinder engines. At the back of the stand was a weird type of spark-demonstrating machine which made people wonder where they spent the previous night.

7. Brown Brothers, Ltd., 20/34, Great Eastern Street, London, E.C.2, who were among the first motoring firms to establish a name for themselves in the aircraft world and who have had the good sense and foresight to remain in the Industry during the dark days, showed every kind of accessory one can think of in connection with aviation and motoring. There were also displays of clothing, parachutes, airscrews, and many other contrivances.



B.T.H. Magnetos.—Left and centre the A.V.12 and the A.V.8 for 12 and 8-cylinder engines. Right, a 9-cylinder magneto for radial engines with spigot mounting.



"DYAK" AERO ENGINE, 100. hp.

SUNBEAM-COATALEN AIRCRAFT ENGINES

ARE SECOND TO NONE

THE SUNBEAM MOTOR CAR CO., Ltd.
MOORFIELD WORKS, WOLVERHAMPTON.

8. Marconi's Wireless Telegraph Company, Ltd., Marconi House, Strand, W.C.2, showed a small installation set for sending and receiving, weighing only 63 lb. These are being supplied to Handley Page Transport, Ltd., and the Instone Air Line.

9. D.A.P. Model Aero and Engineering Co., 185-7, Replingham Road, Southfields, London, S.W.18, showed a series of models driven by compressed air or elastic. Also a model of a Baby Avro with what has been said (not by the firm) to be a "statue" of Mr. Bert Hinkler in the cockpit.

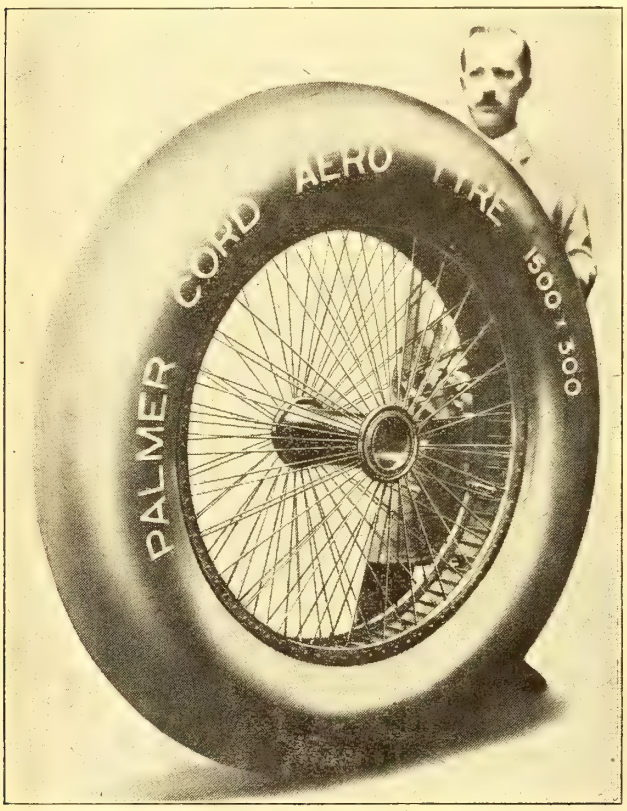
10. Cross-Atlantic Newspaper Service, Ltd., Cross-Atlantic House, 184, Fleet Street, London, E.C.4, showed copies of "The Aerial Year Book and Who's Who in the Air" (1920). There were also some forms to be filled by aspiring "Whos" who desired to become permanent "Whos."

12. Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, London, had a most artistic stand on which their famous green line of "Pratts" were shown. Owing to the rules of the exhibition the petrol was present in spirit only.

13. Vickers, Ltd., Vickers House, Broadway, Westminster, London, S.W.1, the owners of the product known as "Duralumin," showed all sorts of aeroplane and airship parts made of this alloy. There were tail skids, parachute cases, built-up girders, spars, struts, and various household articles. The "tin" Short machine shown on another stand is composed of duralumin, as was the Beardmore airship compartment. One believes that there was no aircraft at the Show in which there was no Duralumin.

14. Joseph Owen and Son, Ltd., 199a, Borough High Street, London, S.E.1, showed various sections of trees and also planks of the types of wood used in aircraft production.

15. The Palmer Tyre, Ltd., 119, 121, 123, Shaftesbury Avenue, London, W.C.2, showed a whole family of different-sized tyres. There was also the machine which imparts such a human touch to making Palmer Cord tyres. This machine always is a great attraction and seems to take such infinite pains over its job. There were also various water-colours by Mr. Geoffrey Watson depicting various types of aeroplanes.



16. Brownie Yu Yu models constructed of paper by C. Yuske.

27. Elmsfield Mansions, Balham, S.W., was shown performing its tricks. One believes more of these instructive toys would have been sold if the price had been 2s. instead of 6s.

17. A. C. Greene, 6, Trenmar Gardens, College Park, London, N.W.10, showed models including an H.P. 0/400, which lights up inside.

18. Bullivant and Co., Ltd., 72, Mark Lane, London, E.C.3, showed various samples of flexible wire rope and cord for aircraft.

23. The Photographic Department of the once well-known Aircraft Manufacturing Co., Ltd., Hendon, N.W.9, showed various photographs taken from Mr. Riley's D.H.9.

24. John Thompson Motor Pressings, Ltd., Ettingshall, Wolverhampton, showed familiar-looking nose-cowlings, also engine pressings.

25. British Cellulose and Chemical Mfg. Co., Ltd., 8, Waterloo Place, London, S.W.1, "handed out the dope" in what looked like a chemist's shop. The bases for their various dopes are shown, and it will interest many to learn that identification marks latterly were done with actual dope and not merely painted on. Dope frames were also shown.

26. Soc. Anom. Louis Breguet, 115, Rue de la Pompe XVIe, Paris, showed two excellent models—one the commercial machine so well known to the habitués of Croydon, and the other the Leviathan.

27. The Hoyt Metal Co. of Great Britain, Ltd., 105, Decdar Road, Putney, London, S.W.15, showed different sorts of engine castings and engine bearings.

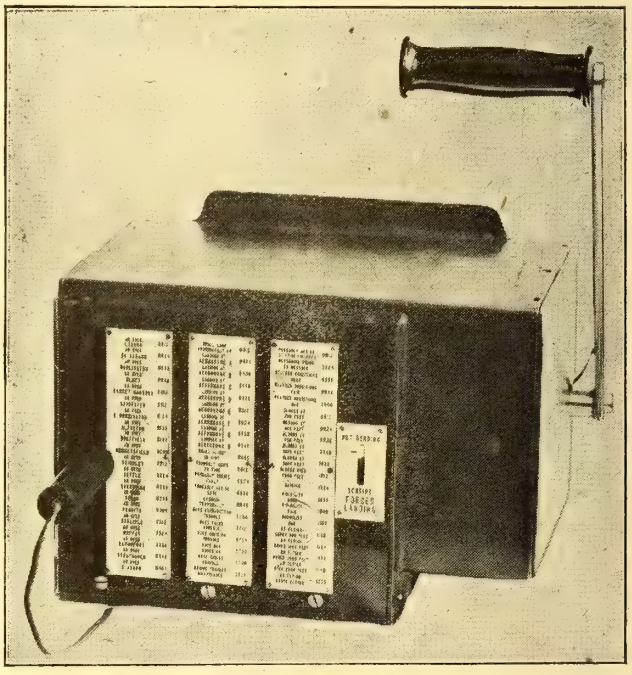
28. Bruntons, Musselburgh, Scotland, showed Raf wire, locknuts, and a whole host of the small accessories so necessary to the Aircraft Industry.

29. The Falcon Airscrew Company and D. M. Davies, 113, Cottenham Road, Holloway, London, N.W.19, showed several airscrews of both the two- and the four-bladed variety.

30. Serck Radiators, Ltd., Warwick Road, Greet, Birmingham, showed various types of aeroplane radiators. They also had their stand skilfully decorated with radiator pipes.

31. Ripaults, 1, King's Road, St. Pancras, London, N.W.1, showed their world-famous "Oleo" aero plugs and accessories.

32. Automatic Telegraph Co., 132, Charing Cross Road., London, W.C.2, showed their automatic telegraph. The mechanism is a rotating drum of insulating material whereon there are arranged a series of contacts which, when they are rotated past a contact brush, automatically send the Morse version of a series of coded signals. The operator has merely to insert a plug into the hole corresponding to the particular message which he wishes to send and pull an operating lever and a clockwork train then causes the contact drum to move in such a way that the complete series of code signals for that message together with the call sign of the sending station is automatically sent by the mechanism.



Exterior of the Automatic Telegraph Co.'s Aircraft Transmitter, showing the plug and the plug board with the standardised messages alongside the plug holes. The handle on the right is pulled after the proper message has been plugged in and the machine does the rest.

33. General Accident, Fire, and Life Assurance Corporation, Ltd., Aldwych, London, showed and explained their insurance policies.

34. A. E. Parnacott, F.R.S.A., M.I.Ae.E., Engineer, Penge Lane, Penge, London, S.E.20, showed, among other things, the plug testing apparatus which was such a familiar sight in the A.E.O.'s den in squadrons overseas.

35. Tan-Sad Works, 9, Freeman Street, Birmingham, besides showing a neat form of "flapper bracket" for the designing (in the "catty" sense) sex, had a neat aluminium chair which is suggested for use in aeroplanes. It could be constructed of duralumin.

Beardmore

LONDON—CHRISTIANIA

(750 Miles in 9 hours)

ON AN A.W. MACHINE (EX GOVERNMENT) FITTED WITH

STANDARD 160 h.p. BEARDMORE ENGINE

Vide the following extract from the *Daily Mail*, Saturday, 26th June, 1920:—

NORTH SEA FLYER.

MAJOR GRAN REPEATS PIONEER FEAT.

From Major TRYGVE GRAN,
Copenhagen, Friday.

"I have to-day repeated my North Sea Flight.

"I landed at Skagen last night and arrived at Christiania to-day.

"My flying time from London to Christiania (750 miles) was nine hours.

"I intend to make a European circuit."

*** The first airman to fly across the North Sea (a 1914 feat), Major Gran is the Anglo-Norwegian explorer and airman who, after serving in the Flying Corps during the War, had an air honeymoon last summer.

BEARDMORE AERO ENGINES, LTD.,
112, Great Portland Street, London, W.1.
Telephone: 238 GERRARD.
Works - - - Parkhead Steel Works, Glasgow.

AeroEngines

36. Northern Engineers' Supply Co., John Street, Sheffield, showed spare parts for Le Rhône, Clerget, R.A.F., Siddeley "Puma," Hispano-Suiza, and Monosoupape engines, including castings, exhaust and inlet pipes, and many other engine necessities.

37. The Bournemouth Aviation Co., Ltd., The Aerodrome, Ensbury Park, Bournemouth, showed a photographic record of their activities.

38. A. E. Jones, Ltd., 52, High Street, New Oxford Street, London, W.C.2, showed models of all shapes and sizes. Also spare parts for the construction and reconstruction of these.

39. Everyone knows all that can be said about Titanine, Ltd., 175, Piccadilly, London. Samples of the non-poisonous dope were shown, also identification paint and dope frames as tight as drums.

40. Thos. Firth and Son, Ltd., Norfolk Works, Sheffield, of stainless steel and reputation, showed stainless examples of "dazzling discoveries."

The largest exhibit is a small travelling crane. There were also valves of different kinds and fittings for machines of Martinsyde and Sopwith design. It has been suggested that here may be found parts of the 11,238th Sopwith machine constructed during the war.

68. Gas Accumulator Co. (U.K.), Ltd., Beacon Works, Brentford, who supply the lighthouses, at any rate on the British sector of the air lines to the Continent, showed an aerial light and several other kinds. These are all of the automatic type that light themselves by means of a "sun valve" when a certain standard of darkness is about and extinguish themselves when the darkness is not sufficient. They are made to flash certain Morse signals.

72. The Glacier Metal Co., Ltd., Waldo Road, Willesden Junction, London, N.W.10, showed samples of Findlay's special motor metal, looking like buns in a baker's shop. Also white metal bearings.

74. Pettet's Patent Safety Filler Co., West Pier, Brighton, showed an attachment for fitting to petrol cans which prevent waste by splashing or overfillling. It also strains the "essence" and prevents foreign matter intruding in the tank.

75. Simms' Motor Units (1920), Ltd., Percy Buildings, Cresse Street, Rathbone Place, London, W.1, showed all sorts and conditions of magnetos made by them. There were also a few running which gave a spark that made every motorist who does not own one green with envy.

76. British Emaillite Co., Ltd., and General Aeronautical Co., Ltd., 5, Hythe Road, Willesden Junction, London, N.W.10, exhibited their different Emaillite doping schemes. There were dope frames doped in varying colour schemes, red, white, blue, khaki, grey, etc.

G.A.C. airscrews of the four and two-bladed variety were shown beautifully finished off and coloured.

77. Yorkshire Steel Co., Ltd., 30, Holborn, London, E.C.1, who hold all the patents for the famous inventions of Col. Holt (who must not be confused with Group Captain F. V. Holt, D.S.O., R.A.F., now in China), showed Holt landing flares. These at first were turned down by the R.F.C. as dangerous, but later adopted universally. There was also an ingenious automatic parachute mail-dropper, and a life-saving parachute, and many other interesting exhibits.

78. Rene Tampier showed the famous Bloctube carburetter as fitted to Hispano-Suiza and other engines, and some beautifully lacquered airscrews.

79. Chance Bros. and Co., Ltd., showed revolving lights for aerial lighthouses. These have been described in full in a recent number of The Aeroplane.

80. W. D. Oddy and Co., Ltd., Globe Road, Leeds, showed airscrews of all sorts, shapes and sizes. The largest one was 18 ft. in diameter and is for the R.38. This should give our American cousins a good idea of what we can do in airscrews. Then there were those for Napier engines, one of which is for a motor boat. A novelty was a model of an airscrew with adjustable and reversible pitch.

80a. Metal Airscrew Co., Ltd., Regent House, Kingsway, London, W.C.2, showed their "Leitner-Watts" principle for metal airscrews.

81. Rubery, Owen and Co., Darlaston, South Staffs, showed their patent release gear which is now used as a bomb release. Some will remember the success of this "gadget" before the days of chocks. There was also an excellent hand vice for ensuring a good grip. But chiefly of interest were their various samples of metal spar construction.

82. Cellon (Richmond) Ltd., 22, Cork Street, London, W.1, showed all kinds and conditions of dopes. The stand was decked with their familiar dope cans. The less known "Cerric" preparation for lacquering wires and metal parts was to be seen.

83. The British Wright Co., Ltd., 9, Galen Place, Bury Street, London, W.C.1, exhibited the Ogilvy speed indicator and pressure gauge. There is also a very sensitive bubble statoscope and the Hull speed of rise and fall indicator. The Darwin turn indicator, like the ostrich, seems capable of anything short of digesting nail scissors.

84. Wellworthy, Ltd., Lymington, Hants, had specimens of Wellworthy new process piston rings. Also an assorted collection of special gudgeon pins, valves, compression taps, etc.

85. North and Son, Ltd., 14, Soho Square, London, W.1, showed the Watford magneto and Watford revolution indicator usually known as a "rev. counter" but scientifically called a tachometer. They also had various armatures on show, and a squadron of magnetos gave a firework display by flights.

86. The Palnut Co., Ltd., 6, Great St. Helens, London, E.C.3, had all sorts of nuts and bolts. Their *pièce de resistance* is the "Palnut" (patented) lock washer, which is an entirely new departure in safety lock washer construction.

87. The Skefko Ball Bearing Co., Ltd., showed an infinite range in size of balls and ball races. Those who went through R.F.C. schools of instruction know all about the SKF self-aligning ball races.

88. C. C. Wakefield and Co., Ltd., Wakefield House, 30/32, Cheapside, London, E.C.2, the makers of "Castrol," showed samples of winter and summer type oil. The well-known tins were shown round the stand, which was one of the prettiest in the show.

89. H. M. Hobson, Ltd., 29, Vauxhall Bridge Road, London, S.W.1, showed their wholly excellent aeroplane carburetters attached to such animals as a "Lion," a "Puma," an "Eagle," etc. It was chiefly due to this carburetter that Renault engines used to survive on "Rumpeties" in the early days of the war when these machines were worrying and being worried by Hunlike pupils.

90. The Telephone Manufacturing Co. (1920), Ltd., Hollingsworth Works, Martell Road, West Dulwich, London, S.E.21, showed telephones whereby such curiously opposite (from a spectator's point of view) people as deep-sea divers and aviators can intercommunicate whilst at work.

91. S. Smith and Sons (Motor Accessories), Ltd., 179-185, Great Portland Street, London, W.1, showed almost every "gadget" an aviator can want both for his own and his machine's personal comfort. There were Thermos flasks, armature sections, helmets, plugs, safety belts, mascots, etc.

92. Hadfields, Ltd., East Hecla Works, Tinsley, Sheffield, showed forgings, stampings, etc., and an impact testing machine. There was also a large coloured photograph of their works, showing a bar of metal being dealt with.

93. Aviation Insurance Association, 1, Royal Exchange Avenue, London, E.C.3, showed proposal forms for policies, also maps portraying the whereabouts of their principal activities.

96. "Shell" Marketing Co., Ltd., 39/41, Parker Street, Kingsway, W.C.2, showed several of their well-known red and gold coloured tins of aviation and motor spirit, in which, of course, they only kept the excellent, but forbidding (so far as petrol is concerned) atmosphere of Olympia. There were also some large barrels for petrol, empty at the moment but before these lines see light they may contain the dead body of the man who made horrid noises with the wireless set in the gallery.

97. Samuel Bros., Ltd., of Oxford Street and Ludgate Hill, London, showed leather and waterproof clothing. There was some Omne Tempus rainproof cloth on one side of which water continually dripped, but which was absolutely as dry as America on the reverse side.

98. The Robinhood Engineering Works, Ltd., Putney Vale, London, S.W.15, showed a range of K.L.G. sparking plugs. These were also shown in section. Four of the plugs used during Mr. Hawker's famous long-distance bathe were exhibited.

99. Sampson, Low, Marston and Co., Ltd., 100, Southwark Street, London, S.E.1, showed various books, including "All the World's Aircraft," which one hopes is in possession of all readers of The Aeroplane, as this is the only method, in the case of ex-R.A.F. officers, of keeping up to date in knowing aeroplanes by sight.

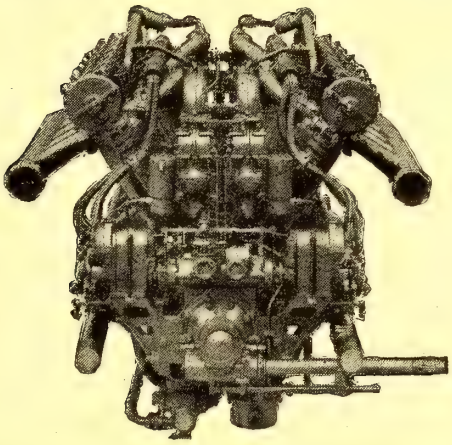
100. Last, but by no means least, one came to the stand of F. Raymond, 81, Rue St. Maur, Paris. This was one of the most popular stands in the whole show and provides amusement for bored exhibitors. Besides those whose motive power is a piece of elastic used on the catapult principle which were used for reconnaissance flights over other stands, there were parachutes shot up by a bow, balloons, and "Papillons merveilleux." The looping models were the ones referred to by the Naval Officer as "returning to the 'and just like a cheque."—G. D.

£100,000,000 STOCK £100,000,000

FLYING BOAT

TYPE F.3

Two 350 h.p.
Eagle Mark VIII
ROLLS ROYCE



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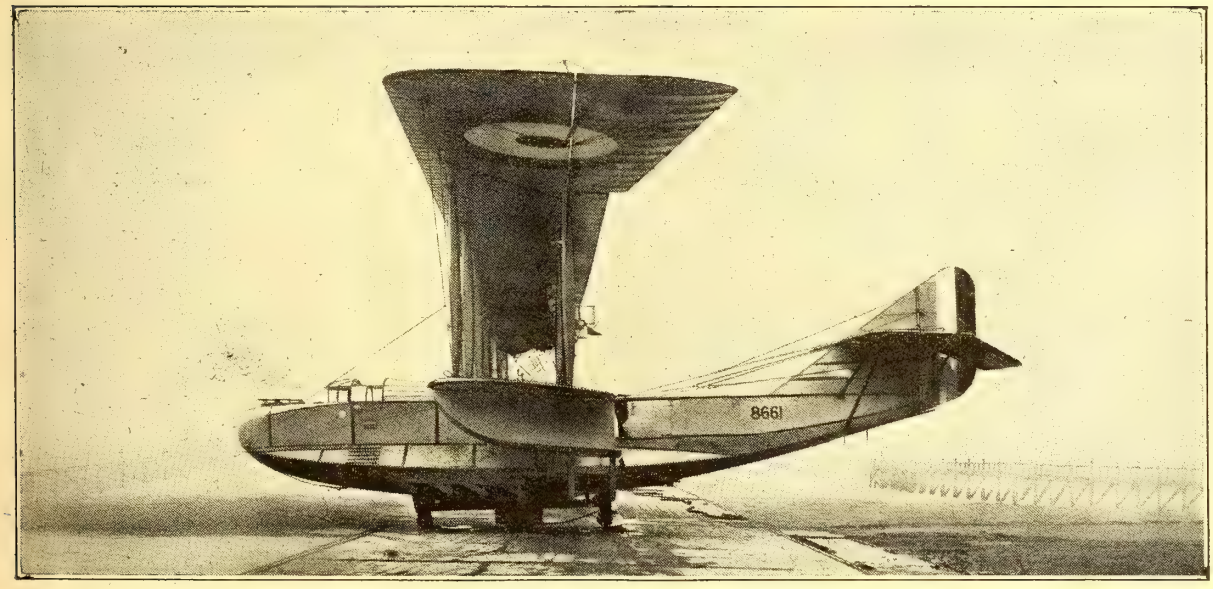
Complete with all essential modifications
£6,000

PRICE
Unconverted, as in present condition
£3,000



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OFFICIAL NOTICES.

The following was issued on July 13th :—

NOTICE TO AIRMEN, No 80
AIR MINISTRY, July 13th.

The following is hereby notified :—

Pilots are warned that, on the occasion of Their Majesties' visit to the Isle of Man on the 14th and 15th instant, they should abstain from flying over the Royal Yacht or Fleet or over the route of the Royal Procession

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(*Compiled by the Staff of* THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
July 12th	A.T. & T.	DH9	G-EAGX	London	Paris *via* Brussels	11.40	18 00	Gd's&M	Nil	Bamber
	A.T. & T.	DH9	G EAPL	London	Paris	11.47	14 20	Nil	2	Reeve
	A.T. & T.	DH16	G-EASW	London	Paris	11.46	14.20	Mail	4	Robbins
	A.T & T.	DH16	G-EALM	London	Amsterdam	11.55	20.29	Goods	1	Lawford
	H.P. & M.A	Breguet	F-CMAB	London	Paris	12.47	15.35	Nil	Nil	Le Men
	A.T. & T.	DH16	G-EALU	London	Paris	17.05	19 30	Mail	3	Powell
	A.T. & T.	DH9	G-EAPU	London	Brussels	17.30	19.30	Nil	1	Lines
	A.T. & T.	DH9	G-EAPU	Paris	London	10.20	12.42	Goods	Nil	Tebbitt
	A.T. & T.	DH16	G-EALU	Paris	London	10.34	12 00	Nil	3	Powell
	C. des G.E.A.	Goliath	F-GEAB	Paris	London	11.50	14.50	Goods	5	Labouchère
	C.T.	Nieuport	F-CGTI	Paris	London	12.56	15.30	Mail	Nil	Le Comte
	A.T. & T.	DH9	G-EAGY	Amsterdam	London	15.05	17.30	Gd's&M	2	Armstrong
	A.T. & T.	DH9	G-EAPL	Paris	London	16 40	19.20	Nil	2	Forson
	A.T. & T.	DH16	G-EAPM	Paris	London	16.55	19 30	Goods	1	Holmes
July 13th	A.T. & T.	DH9	G-EAGY	London	Brussels	09 43	13.45	Goods	Nil	Tebbitt
	A.T. & T.	DH9	G-EAPL	London	Paris	10.07	12.25	Gds & M	1	Bradley
	A.T. & T.	DH16	G-EAPM	London	Amsterdam	10.09	12 45	Gd's&M	2	Armstrong
	C.T.	Nieuport	F-CGTI	London	Paris	13 30	15.50	Nil	Nil	Le Comte
	A.T. & T.	DH9	G-EAGX	London	Paris	16.29	18.35	Nil	2	Forson
	A.T. & T.	DH16	G-EASW	London	Paris	16.43	19.00	Mail	4	Holmes
	A.T. & T.	DH9	G-EAGX	Paris	London	10.05	12.45	Goods	1	Reeve
	A.T. & T.	DH16	G-EASW	Paris	London	10.05	12.45	Goods	1	Robbins
	H.P. & M.A.	Spad	F-CMAW	Paris	London	12.45	15.30	Gd's &M	Nil	Bourdon
	H.P. & M.A.	Breguet	F-CMAB	Paris	London	13 30	17 55	Goods	1	Challaux
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.28	19.17	Nil	2	Lawford
	A.T. & T.	DH16	G-EALU	Paris	London	16.45	19.17	Nil	3	Powell
	A.T. & T.	DH9	G-EAPL	Paris	London	17.20	20.18	Goods	Nil	Bamber
July 14th	A.T. & T.	DH9	G-EAPL	London	Brussels	07.15	—	Goods	Nil	Bamber
	A.T. & T.	DH16	G-EALU	London	Paris	09.40	11.50	Mail	3	Robbins
	A.T. & T.	DH16	G-EALM	London	Amsterdam	10 32	13 05	Goods	Nil	Powell
	C. des G.E.A.	Goliath	F-GEAB	London	Paris	11.00	14.25	Goods	1	Labouchère
	H.P. & M.A.	Spad	F-CMAW	London	Paris	12.33	16.20	Goods	Nil	Bourdon
	H.P. & M.A.	Breguet	F-CMAB	London	Paris	12.55	15.40	Goods	2	Challaux
	A.T. & T.	DH9	G-EAPL	London	Paris	16.40	19.00	Goods	1	Reeve
	A.T. & T.	DH16	G-EASW	London	Paris	17.05	19 25	Mail	4	Game
	A.T. & T.	DH9	G-EAPU	London	Paris	18 15	20.25	Nil	1	Bradley
	A.T. & T.	DH16	G-EASW	Paris	London	10.25	12.50	Nil	4	Tebbitt
	A.T. & T.	DH9	G-EAPU	Brussels	London	11.45	14.15	Nil	Nil	Lines
	A.T. & T.	DH9	G-EAPL	Brussels	London	11.45	14 23	Nil	Nil	Bamber
	A T. & T.	DH16	G-EAPM	Amsterdam	London	16.08	18.40	Gds.& M	2	Powell
	A.T. & T.	DH16	G-EALU	Paris	London	16.20	18 35	Nil	1	Holmes
July 15th	A.T. & T.	DH9	G-EAGY	London	Brussels	06.50	—	Papers	Nil	Lines
	A.T. & T.	DH16	G-EALU	London	Paris	10.05	12.05	Gd's& M	2	Tebbitt
	A.T. & T.	DH16	G-EAPM	London	Amsterdam	10 05	12.40	Goods	1	Armstrong
	A.T. & T.	DH9	G-EAGY	London	Paris	17.00	19.30	Mail	1	Bamber
	A.T. & T.	DH9	G-EAQL	Paris	London	10.10	12.10	Nil	2	Forson
	A.T. & T.	DH16	G-EASW	Paris	London	10.10	12.10	Nil	4	Robbins
	A T. & T.	DH9	G-EAGY	Brussels	London	10.50	13.30	Nil	2	Lines
	C. des G.E.A.	Goliath	F-GEAC	Paris	London	11.50	15.20	Goo s	3	Labouchère
	H.P. & M.A.	Spad	F-CMAW	Paris	London	12.30	14.48	Gds.& M	2	Bourdon
	H.P. & M.A.	Breguet	F-CMAB	Paris	London	13.25	16 30	Goods	2	Martel
	A.T. & T.	DH16	G-EALU	Paris	London	16.15	18.45	Nil	3	Tebbitt
	A.T. & T.	DH9	G-EAPU	Paris	London	16.30	19.08	Goods	1	Reeve
	A.T. & T.	DH9	G-EAGX	Paris	London	17 40	20.15	Nil	2	Bradley
July 16th	A.T. & T.	DH9	G-EAPU	London	Brussels	06 30	08.45	Goods	1	Forson
	A.T. & T	DH9	G-EAQL	London	Paris	09.17	11 55	Goods	2	Holmes
	A.T. & T.	DH16	G-EALU	London	Paris	09.30	12.00	Mail	4	Robbins
	H.P. & M.A.	Breguet	F-CMAB	London	Paris	09.35	12.35	Nil	3	Martel
	A.T. & T.	DH9	G-EAGX	London	Paris	09.53	—	Goods	1	Milnes
	A.T. & T.	DH16	G-EASW	London	Amsterdam	12.50	15.27	Goods	Nil	Game

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
July 16th	A.T. & T.	DH9	G-EAPL	London	Paris	17.05	19.45	Nil	2	Shaw
	A.T. & T.	DH16	G-EAQS	London	Paris	17.30	19.50	Mail	1	Tebbitt
	A.T. & T.	DH9	G-EAPU	London	Paris	18.30	21.05	Nil	2	Lines
	H.P. & M.A.	Spad	F-CMAW	London	Paris	18.40	21.10	Nil	Nil	Bourdon
	A.T. & T.	DH9	G-EAPU	Brussels	London	09.45	13.00	Goods	1	Forson
	A.T. & T.	DH9	G-EAPL	Paris	London	10.20	12.29	Goods	Nil	Tebbitt
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15 12	17.35	Gds& M	Nil	Armstrong
	*Franco-Roumania Co'y	Potez	F-FRAA	Paris	London	16.35	18.30	Nil	1	Bajac
	A.T. & T.	DH9	G-EAQL	Paris	London	16.02	18.20	Nil	2	Bamber
	A.T. & T.	DH16	G-EALU	Paris	London	16.50	19.00	Nil	4	Robbins
	A T. & T.	DH9	G-EAGY	Paris	London	17.40	19 40	Goods	1	Holmes
July 17th	A.T. & T.	DH9	G-EAQL	London	Brussels	06 30	08.45	Goods	Nil	Reeve
	A.T. & T.	DH16	G-EALM	London	Paris	10.10	12.40	Gds& M.	3	Bradley
	C. des G.E.A.	Goliath	F-GEAC	London	Paris	11.05	16.10	Nil	5	Labouchère
	A.T. & T.	DH9	G-EAQL	London	Amsterdam	15.15	16 45	Nil	2	Forson
	A.T. & T.	DH16	G-EAQS	London	Paris	16.35	18.45	Mail	3	Robbins
	H.P. & M.A.	DH9	G-EATA	London	Amsterdam	16.40	—	Nil	2	Penny
	A.T. & T.	DH16	G-EAQS	Paris	London	10.05	12 08	Goods	3	Tebbitt
	A.T. & T.	DH9	G-EAQL	Brussels	London	—	12 40	Nil	Nil	Reeve
	H.P. & M.A	Breguet	F-CMAB	Paris	London	13 15	16.20	Gds& M.	2	Challaux
	A.T. & T.	DH16	G-EASW	Amsterdam	London	15.10	18.40	Nil	3	Game
	A.T. & T.	DH16	G-EALM	Paris	London	17.17	19.45	Goods	4	Bradley
July 18th	A.T. & T.	DH18	G-EARI	London	Paris	11.10	13.20	Nil	5	Powell
	A.T. & T.	DH9	G-EAPU	Paris	London	10.50	13.45	Nil	2	Lines
	A.T. & T.	DH9	G-EAPL	Paris	London	11.15	13.45	Nil	2	Shaw
	A.T. & T.	DH16	G-EAQS	Paris	London	12 10	14 25	Nil	3	Robbins
The Air Port of Cricklewood.										
July 12th	H.P. & M.A.	Hand'y Page	G-EASN	London	Brussels	12.00	15.20	Freight	—	
	H.P. & M.A.	Hand'y Page	G-EASY	London	Paris	12.25	15.45	Freight	8	
	H.P. & M A.	DH9	G-EATA	Amsterdam	London	11.44	—	—	—	
	H P. & M.A.	Hand'y Page	G-EATG	Paris	London	12.55	16.00	Goods	8	
July 13th	H.P. & M.A.	Hand'y Page	G-EATH	London	Paris	12.30	15.15	Goods	7	
	H.P. & M.A.	Hand'y Page	G-EASY	Paris	London	11 50	15.00	—	7	
	H.P. & M.A.	Hand'y Page	G-EASZ	London	Paris	12.05	—	Goods	7	
July 14th	H.P. & M.A.	Hand'y Page	G-EASL	London	Brussels	12.15	15.00	Goods	3	
	H.P. & M.A.	DH9	G-EAUI	London	Amsterdam	16.05	—	Mail	2	
	H P. & M A.	Hand'y Page	G-EASZ	Paris	London	13 25	16 45	—	4	
	H.P. & M.A.	Hand'y Page	G-EATH	Paris	London	14.13	17.20	—	5	
July 15th	H.P. & M.A.	Bristol	G-EASV	London	Paris	08.20	11.15	—	2	
	H.P. & M.A.	Hand'y Page	G-EASL	Brussels	London	12.00	15 30	—	4	
	H.P. & M.A.	Hand'y Page	G-EATG	London	Paris	12.06	15.20	—	8	
	H.P. & M.A.	Hand'y Page	G-EASM	London	Paris	12.15	15.30	Goods	6	
	H.P. & M.A.	Bristol	G-EASV	Paris	London	18.45	21.50	—	2	
	H.P. & M.A.	DH9	G-EAUI	London	Amsterdam	—	19 10	G'ds&M	—	
July 16th	H.P. & M.A.	Hand'y Page	G-EATJ	London	Brussels	12.25	15.20	—	3	
	H.P. & M.A.	Hand'y Page	G-EASM	Paris	London	12.30	15.30	—	4	
	H.P. & M.A.	DH9	G-EAUI	Amsterdam	London	11.28	14.10	Goods	1	
	H.P. & M.A.	DH9	G EAUI	London	Amsterdam	16.05	—	Mail	1	
	H.P. & M.A.	Bristol	G-EASV	London	Paris	18 15	21.1	—	2	

July 17th.—No Reports. July 18th.—No Reports.

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; H.P. & M.A.—Handley Page and Messageries Aeriennes. I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company, M.W.T.C.—Marconi Wireless Telegraph Company.

Where times are missing it is probably owing to Atmospherics affecting signals.

* This is not intended to be a regular service between Paris and London, but a special trip.

Flying at Croydon.

July 12th.—C.A.C., 1 Avro return Northolt, I.A.L., D.H.4a, to Isle of Man, Mr. Barnard.

July 13th.—Nil.

July 14th.—A.T. and T., 3 Avro joy-rides; I.A.L., Vickers-Vimy, 1 test; Bristol Aeroplane Factory, 1 Bristol monoplane from Bristol, G.E.A.S.R., Mr. Uwins.

July 15th.—A.T. and T., 2 Avro joy-rides and 1 flight for photographs; M.W.T. Co., 1 wireless test.

July 16th.—A.T. and T., 1 test, D.H.16; 2 Avro joy-rides.

July 17th.—A.T. and T., D.H.18, 3 tests; 1 Avro test; 2 Avro joy-rides; I.A.L., D.H.4a, from Isle of Man, Mr. Barnard; Vickers-Vimy, 2 joy-rides; H.P. Co., D.H.9 from Cricklewood.

July 18th.—A.T. and T., 2 D.H.9s, photography; I.A.L., iVckers, joy-riding; Capt. Jordan on "Snipe" to Brooklands.

The London Terminal Aerodrome.

Although the recent spell of bad weather stopped pure joy flying the large majority of machines flying to schedule suffered no interception. The Henri Potez machine arrived on Friday from Paris, and on Wednesday, Mr. Uwins, who is flying the Jupiter engined Bristol in the Derby, flew round the course on a Bristol monoplane and landed at Croydon.

Apropos of the Derby, why do the newspapers head articles on this subject "Air Race Round London"? One never sees the animal affair headed "Horse race round Epsom," or some such phrase.

On Sunday, a D.H.16 arrived rather suddenly on its nose, the undercarriage having gone in first landing. The C.A.T.O. thereupon placed four small red flags round the machine, not as was suggested, to show it was a dangerous spot on which to effect a landing, nor to slow up the machine, but to show that it was "a accident" and not the normal method of decanting passengers on landing.—G. D.

The Instone Air Line.

The D.H.4a has been away at the Isle of Man during the week where she has been taking passengers in connection with the Royal visit. Mr. Barnard was pilot and was cursed with plenty of misty weather for the long sea crossing.

The "Vimy" is itself again, and was joy-riding over the week-end. One has had the pleasure of several joy-rides in this machine. In the front seat by the pilot it is really delightful, and one was taken for an extended flight round London and district. The machine handles easily, and, for a big machine, quickly, and in bumps is quite stable.

On Sunday one tried the inside of the cabin, together with some very precious cargo among the passengers. The windows all open, and if one gets "fed-up" with "allenclosedness," one can open the window and lean out for air. This latter expedient may also be useful in rough weather. Messrs. Barnard and Chattaway both handle the "Vimy" machine exceedingly well.—G. D.

The "Times" by Air.

One gathers that in future the *Times* newspaper will be on sale in Paris by 08.00 o'clock. This is made possible by arrangements between the proprietors of the *Times* and A.T. & T., Ltd., who will dispatch the paper by air at 04.00 hr.

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Whether the innovation will be as popular with the pilot who has to get up early for the start as with the readers of the paper in Paris remains to be seen, but it should serve as a pleasant reminder to the former of his early morning patrols during the German War.—G. D.

Lepaerial.

The Lepaerial Travel Bureau, Ltd., Piccadilly Circus, on one day last week received bookings by air from London to Paris, Brussels, Antwerp, and Amsterdam.

They also sent a machine to Gosport for someone who was in a hurry for his holiday.

The Leeds-Holland Service.

The North Sea Aerial and General Transport, Limited, has not recently carried out any flights from Leeds to Holland, but a fresh consignment of goods from the firm which originally used this means of transport to Holland is now ready, and will shortly be sent across.

Mr. B. Haydn White, lately London manager for the North Sea Company, is taking a Blackburn "Kangaroo" to Holland in order to give pleasure flights.

Barrow.

The Rigid airship R.80, built by Vickers, Ltd., Barrow, underwent her first test on Monday, July 19th. One understands that this was not in any way a speed test, but merely a first introduction to the air.

The R.80 is smaller than the R.34, having a capacity of 1,250,000 cu. ft. It is understood that this ship, which was primarily intended to be used for war purposes, is to be used commercially.—G. D.

Brooklands.

One understands that Mr. F. P. Raynham met with an accident on Sunday from which he escaped with some bruises, through the machine was "written off." The machine was the F.4 Martinsyde on which Squadron Leader T. O'B. Hubbard had entered for the Derby, and whether Squadron Leader Hubbard has obtained a new machine or not, one does not know at the moment of writing.

Mr. Raynham's accident seems to have been caused by the presence of a mowing machine on which he landed or into which he ran. Capt. Jordan, who was flying at Brooklands on the same day, tells one that owing to obstructions on the ground caused by hay and mowing machines, etc., a landing was quite difficult to effect *whole* on any machine.—G. D.

Godalming.

A paragraph in the *Surrey Advertiser* informs one that an old Carthusian aviator, no name mentioned, gave a particularly daring exhibition of "stunt" flying over Charterhouse School at Godalming on July 12th. Whether the manœuvres were carried out at a safe altitude or otherwise was not stated.

J. F. S.

Kingston.

On July 16th, H.R.H. the Duke of York, as President of the Industrial Workers Union, accompanied by Major Greig, paid a visit to the works of the Sopwith Aviation and Engineering Co., Ltd., at Kingston-on-Thames, where he inspected the manufacture of aeroplanes and also of the A.B.C. motor cycles. The Duke spent a considerable time in the various shops, under the guidance of the Chairman, Mr. T. O. M. Sopwith, C.B.E., and the directors, and expressed himself as particularly pleased with the means which had been taken to ensure the welfare of the workers.

At the Duke's request several shop-stewards and women workers were presented to him. He afterwards inspected the men's and boys' club-rooms, in which the Sopwith employe is provided with all possible means of recreation.

Northolt.

Mrs. Atkey, who took her pilot's ticket last December, has been putting in quite a lot of flying recently at the Central Aircraft Company's Aerodrome, Northolt. It is understood that Mrs. Atkey proposes to graduate for her Air Ministry's licence and possibly take a machine out to Egypt next winter.

Members of the Cavendish Club spent Sunday afternoon, July 11th, at Northolt aerodrome, and "Centaur" machines were kept busy flying passengers over the surrounding country, and a number of trips over London were also made. These Club meetings are becoming popular at the Aerodrome and the number of passengers carried this year is largely in excess of last season.

Porthcawl.

In the week ending July 10th, several parties of colliers and their families from the valleys took advantage of the fine weather and ventured into the air at the Berkshire Aviation Company's aerodrome on Lock's Common. All agreed flying was just as safe as going "down under," and many of them went up a second time.

On Saturday, July 10th, a short cross-country flight was made to Southerndown, returning along the coast. On the same day, in connection with the local flag day in aid of the Institute of the Blind, several thousand handbills were distributed over the town from the machine and a percentage of the day's taking given to the fund.

Heavy gales have been experienced here the last few weeks, but any risk of damage to the machine has been successfully overcome by a novel method of anchorage.

This is effected by running the machine down a slope into a pit so that the bottom wings are level with the ground. The earth excavated has been made into a bunker on the side from which the prevailing winds blow, thus breaking the force of the wind and minimising its effect on the machine.

The show is being run on an economy basis, the staff consisting of only three ex-Flying Corps officers.

FOREIGN INTELLIGENCE.

FRANCE.

A Flight to Antwerp.

The Under Secretary of State for Aeronautics, M. Flandin, accompanied by his wife, flew in a Farman Goliath biplane to Antwerp on July 19th in order to attend the aviation meeting which forms part of the Olympic Games. In an interview before his departure he said that a new air port was to be opened at Orly, near Paris. Work had been carried out at that place for the last 18 months and the ground was nearly ready for use. Le Bourget was overcrowded and had no airship hangars. Orly is equipped with hangars for airships of all types.

The Prix du Grand Ecart.

On July 13th the third series of attempts on the *Prix du Grand Ecart,* presented by *L'Auto,* were carried out at Villacoublay. In the second series Lieut. Bossoutrot, on a Farman biplane, finished first, M. Pillon, also flying a Farman, second, and Mr. Casale was disqualified. The third series ended with the pilots in the following order: 1, Pillon (Farman), 2, Bossoutrot (Farman), and 3, Casale (Spad).

M. Pillon's times were as follows:—Slow flight, over 3 km. course: outward, 3 min. 42 2/5 sec.; return, 2 min. 18 4/5 sec. Speed: outward, 1 min. 19 1/5 sec.; return, 1 min. 4 3/5 sec.

The final day of the contest was July 18th. Lieut. Bossoutrot, flying a Farman biplane, won the first prize—10,000 fr.—with a maximum speed of 139 km. 896 m. an hour (about 87 m.p.h.), a minimum speed of 23 km. 411 m. an hour (about 14¼ m.p.h.) and a landing run of 52½ yd. M. Pillon (Farman) finished second and M. Casale (Spad biplane) third.

In Memory of the late Wilbur Wright.

On Saturday, July 17th, a marble statue erected at Le Mans to the memory of the late Wilbur Wright was unveiled. The statue is the work of the sculptor Landowski, and shows the struggle of man to conquer the air. Among those present when the monument was unveiled were General Dumesnil, who represented the Government; M. Flandin; Admiral Majinder, representing the U.S. Ambassador; and the Comte Henri de la Vaulx.

The Disposal of Surplus Aircraft.

The Under-Secretary of State for Aeronautics will receive towards the end of the month representatives of the following aeronautical firms:—Blériot, Bréguet, Caudron, Potez, Farman, Buel, Hanriot, Lioré, deMarçay, Latécoère, Salmson, Peugeot, Chausson, Louis Clément, the Compagnie Aérienne française la Franco-Bilbaine, and the Syndicat du réseau aérien trans-africain. The meeting will discuss in detail proposals for the purchase of surplus stocks of aeronautical material. The disposal of war material is still causing great trouble in France.

Air Navigation Regulations.

M. Deschanel, President of the French Republic, has signed a decree formulating regulations under which aircraft may fly in France.

Under its terms aeroplanes of nations who are signatories of all aerial international agreements to which France is a party have right of passage through that country. As in Great Britain, there are certain prohibited areas over which neither airships, balloons, nor aeroplanes may fly. Aircraft from foreign countries must not diverge from the aerial routes which will be listed at a later date.

All aircraft, French or foreign, may fly freely in France provided the following conditions are observed:—(a) that they carry a navigability certificate, (b) that they are registered in accordance with the prescribed regulations; (c) that they bear the insignia of registration and nationality; (d) that they carry the necessary certificates for the personnel on board; (e) that they carry a list of passengers and (f) a bill of lading in the case of merchandise; (g) that a duly maintained log be carried; (h) that if wireless is fitted the necessary licences are carried, and (i) that in the case of mails the postal authorisation be carried.

The Under-Secretary of State for Aeronautics will issue shortly the conditions under which certificates and licences will be issued and the regulations in regard to the keeping of logs.

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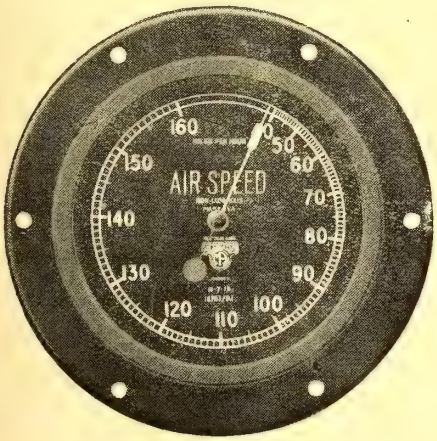

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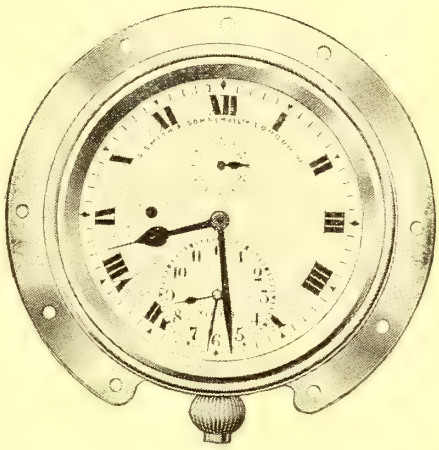

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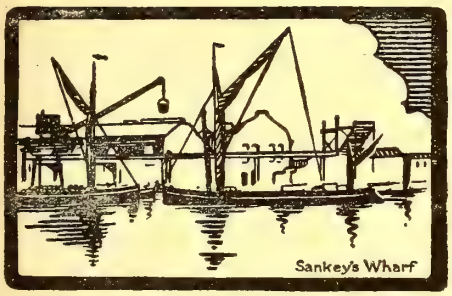

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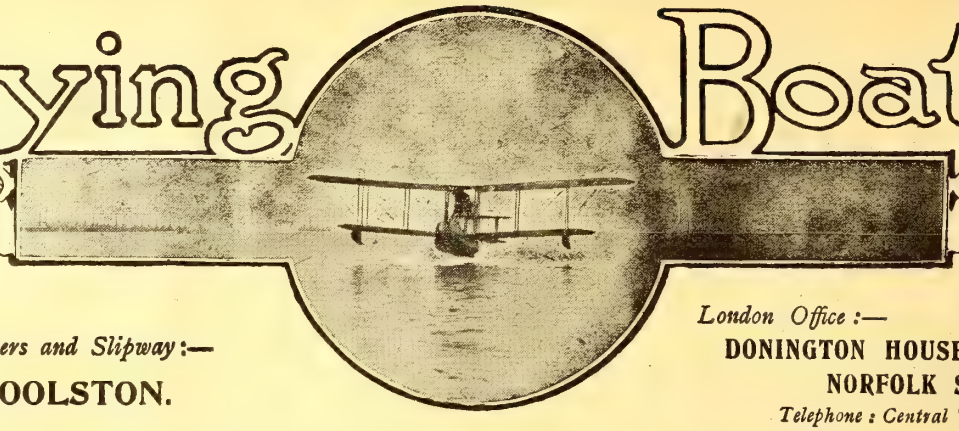

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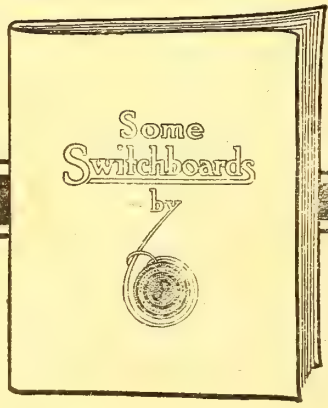

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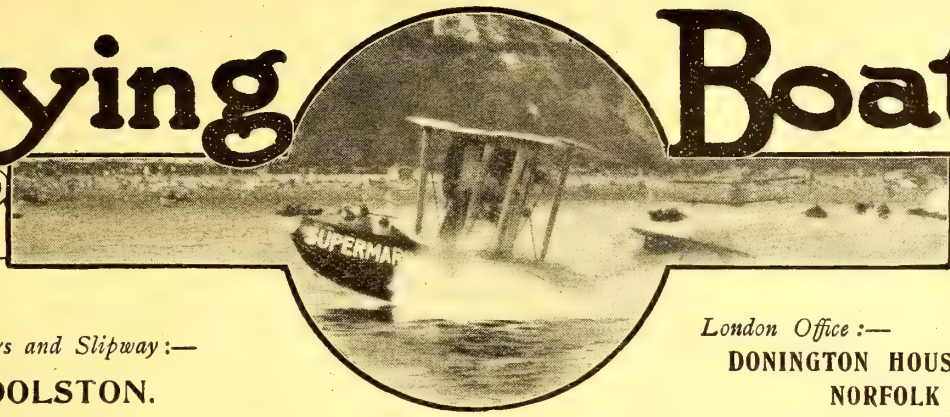

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THE BALLOON APRON INVENTIONS.

The Inventions Committee continued on July 19th to hear evidence in regard to the invention of the balloon-apron system. The examination of Colonel E. B. Ashmore, C.B., C.M.G., M.V.O., was continued. He admitted having seen the description of the Venice scheme before developing his own system. [There was no resemblance between the two methods.] Colonel Ashmore said his idea in drafting the balloon-apron scheme was the limitation of the area of attack.

A claim by Mr. Lowry was considered and withdrawn, as the claimant was in the Straits Settlements.

Lord Tiverton put forward a claim by Mr. E. T. Willows, who stated that, though he did not invent the balloon apron, he solved the problem of attaining high altitudes with the aprons after the technical officers to two Services had failed. Mr. Willows gave evidence.

The hearing was adjourned until July 26th.

THE AIRCRAFT DISPOSAL COMPANY AT OLYMPIA.

THE AIRCRAFT DISPOSAL COMPANY, LTD., REGENT HOUSE, KINGSWAY, LONDON, W.C.2, who, as is well known, are the successors to the not very successful Government Aircraft Disposals Board, are to be congratulated on turning this somewhat haughty and mysteriously inactive board into a successful business concern.

With the machines that are for sale one hopes to deal at an early date, but suffice it to say that in the depot at Waddon there have been more gaps each time one has visited it, which seems to point to the fact that many more machines than is generally supposed have been sold.

In this number of THE AEROPLANE one is more concerned with accessories. From one's own personal observation and Mr. Handley Page's remarks at the famous "binge" it seems that one can obtain anything for aviation from a Pemberton-Billing house to a Mallaby-Deely suit. One can obtain several tons of ball races such as Skefko, Auto, Ransome and Marks, etc., and all engine spares it is possible to conceive: plugs, valves, magnetos, carburetters, by the thousand.

Instruments too may be obtained at once and in any quantity at most reasonable prices. These include watches, which latter one can particularly recommend, seeing that one's own came from this establishment, and it neither loses nor gains a fraction of a minute, and is dead accurate. This may be of interest as an absolute contradiction of the statement one has heard to the effect that these watches are nothing but "junk."

Full details with prices, all extremely moderate, may be obtained from Kingsway. The company, besides exhibiting types of the machines sold by them, showed most of the articles mentioned above in the historical section, which proved to ex-Service people of such outstanding interest.

MODERN METHODS.

Mr. John de Lyle, for whose arrest a warrant had been issued, relying on the fact that the conventional methods of the police would move them to watch all sea ports and yet ignore air ports, arrived at Croydon last week and, after a certain amount of difficulty, obtained a special D.H.9. With Mr. Bradley as pilot he reached Paris safely the same evening.

BY ERROR.

It was recorded in the last issue of THE AEROPLANE that the Wright Aeronautical Corporation, of Paterson, New Jersey, had obtained an injunction against the sale or use in the United States of America of any foreign-built machines embodying features which are an infringement of the Wright patents.

The injunction was granted in a suit against the Inter-Allied Corporation, of New York, which was stated, by some extraordinary error, in this paper to be an offshoot of Handley Page, Limited.

As a matter of fact the Inter-Allied Corporation of New York is connected with the Bishop-Barker concern run by the two Canadian R.A.F. officers of those names, and it has nothing whatever to do with Handley Page, Limited, in any way.

A TRADE MOVE.

Rolls-Royce, Limited, announce that Mr. A. F. Sidgreaves has joined the staff of Rolls-Royce, Ltd., as export manager.

AIRCRAFT IN PARLIAMENT

HOUSE OF COMMONS.

July 12th.—The following written answer was given:—

AIR PAGEANT, HENDON.

Mr. JESSON asked the Secretary of State for Air what was the approximate cost of the air pageant at Hendon on Saturday, July 3rd; whether such a cost was included in the Air Force Estimates; if so, under what Vote; and if it is necessary to obtain the sanction of the House for such demonstrations.

Mr. CHURCHILL: The pay of the Royal Air Force personnel and the running expenses of Royal Air Force machines employed at Hendon on July 3rd are normal charges already provided for in the Estimates under the relevant Votes. I am not aware that there are any other charges to be met from public funds, though there was also a trifling expenditure of old or surplus stores which do not require replacement. The question of Parliamentary sanction does not arise.

* * *

July 14th.—The following oral answers were given:—

BLACK SEA (HOSPITAL SHIPS).

Lt.-Comdr. KENWORTHY asked the First Lord of the Admiralty whether His Majesty's seaplane-carrier *Ark Royal* has been used for carrying refugees who are typhus cases in the Black Sea; how many times she has been so used; whether she was disinfected immediately after each voyage; how many cases of typhus there have been among the crew of this ship; how many of the crew have died; and why properly fitted hospital-ships were not used for this purpose.

The FIRST LORD of the ADMIRALTY (Mr. Long): His Majesty's seaplane-carrier *Ark Royal* was used on one occasion for carrying refugees who were typhus cases in the Black Sea She was disinfected immediately afterwards. There were sixteen cases of typhus fever among the crew in the *Ark Royal*, of whom eight were landed at Batoum on May 14th last, five more landed and sent to the 82nd General Hospital, Constantinople, on May 18th; one, Mr. Scott, warrant engineer, was also sent to this hospital on May 19th; one on May 20th, and one on May 27th sent to the 20th Stationary Hospital. Two deaths were reported, namely Mr. Scott, warrant engineer, and Chief Shipwright C. Mattinson. The only hospital-ship was not at that time available, and the urgency of evacuation necessitated the use of all available craft.

Lt.-Comdr. KENWORTHY: May I ask whether a hospital-ship is now available in the Black Sea; and, if not, would it not be better to send a hospital-ship which is not fully employed from the Atlantic or Home Fleet?

Mr. LONG: I can assure the hon. and gallant gentleman that the Admiralty have done all in their power to secure that there shall be a hospital-ship in attendance.

THE INSTITUTION OF AUTOMOBILE ENGINEERS.

The first meeting of the Institution for Session 1920/1921 will be held on Wednesday, Oct. 13th, when Sir Hy. Fowler, K.B.E., will give his presidential address.

Subsequent meetings of the Institution will be held on the second Wednesday in each month up to May 11th.

The Birmingham meetings of the Institution will be held on Oct. 28th, Dec. 30th, Feb. 24th and April 28th.

The London graduates' meetings will be held on the second Thursday in each month, and the Birmingham graduates' on the third Wednesday in each month.

The first annual dinner of the Institution will be held at the Royal Automobile Club on Wednesday, Oct. 27th, at 7.30 p.m., when it is hoped that a number of important guests will be present. The price of the tickets will be 17s. 6d. per head, excluding wines.

The dates of the Coventry graduates' meetings are as follow:—

Sept. 28th, 1920, business meeting; Nov. 2nd, 17th, and 30th, 1920; Dec. 14th, 1920; Jan. 4th and 18th, 1921; Feb. 1st and 15th, 1921; March 1st and 15th, 1921; April 5th, 1921.

THE INSTITUTE OF AERONAUTICAL ENGINEERS.

JULY NOTICES.

COUNCIL MEETING.—A meeting of the Council was held on July 12th.

ELECTIONS.—Honorary Members: Comm. Dr. Ginaninni; Col. Milivoye Yoksimovitch. Member: Charles Baxter, M.I.Mar.E., F.R.Met.S. Associate Members: Hector Sleeman, Capt. Charles Frobisher, F.R.Met.S.; F. A. Thomas, A.M.I.Mech.E.; Major F. C. Buck; Capt. P. C. C. Passman; Gysbertus Spit

FOREIGN, COLONIAL AND PROVINCIAL BRANCHES.—The Council has appointed a Branches Committee to deal with matters relating to the promotion of branches at home at abroad.

EMPLOYMENT.—Every possible assistance is being given to members in finding berths, and members desirous of availing themselves of this should communicate with the Secretary without delay.

OCTOBER EXAMINATIONS.—Associates and Students who desire to sit for the Intermediate Examination for Associate Membership must make application before Aug. 31st to the Secretary, from whom copies of the rules of examination are obtainable. Pilots may also sit for the Intermediate, and the Final Examination—qualifying for membership—will also be held in October.

FINANCIAL YEAR.—The Council has decided that the first financial year shall be considered to end on Dec. 31st, shortly after which date their Annual Report and Balance-sheet will be presented.

MONTHLY NOTICES.—Members of the Institute who happen to be regular readers of the Journal in which these Notices appear are requested to notify the Secretary accordingly, so that the unnecessary expense of sending out duplicate copies by post may be avoided in future.

DONATIONS.—The Council gratefully acknowledge the further gift of office furniture from the Nieuport and General Aircraft Co., Ltd., and the gift of a complete set of numbers of "Flight," commencing with the first issue, from Frederick R. Simms, Esq.

DOUGLAS SHAW, Secretary.

60, Chancery Lane, London, W.C.2, July 13th, 1920.

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.—The following programme of lectures to the students of Sheffield University has been arranged at the request of the Vice-Chancellor:—

Date of Lectures.	Title.	Lecturer.
Oct. 21st.	"Notes on Inspection of Aircraft Steels."	Brig.-Gen. Bagnall Wild, C.M.
Oct. 28th.	"Steels for Aircraft Tubes."	Dr. Aitchinson.
Nov. 4th.	"Case-Hardened Steels and some Defects met with during Inspection."	Capt. A Thain.
Nov. 11th.	"Cold-Worked Aircraft Structural Steels."	Dr. Aitchinson.
Nov. 18th.	"Materials for Aircraft from the point of view of the Designer."	Mr. A. J. Rowledge.
Nov. 25th.	"The Economical Use of Steel in Aircraft."	Mr. A. A. Remington.

The Council desire to tender their grateful thanks to the following gentlemen for giving their services to deliver popular lectures during the Aero Show at Olympia:—Squadron Leader J. E. H. Pritchard, Capt. P. D. Acland, Mr. Griffith Brewer, Major H. E. Wimperis, Capt. D. Nicholson, and Mr. F. M. Green.

OFFICE.—Members are requested to note that the Offices of the Society at 7, Albemarle Street, W.1., will be closed from July 30th to Aug. 17th.

AUTUMN SESSION.—In addition to the list of lectures announced last week, arrangements are being made at the request of the Aeronautical Research Committee for the reading and discussing of a paper on "A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," which has recently been presented by Squadron Leader R. M. Hill, R.A.F., to that body.

Papers on "Airship Mooring and Handling," "Airship Piloting," and "Airship Fabric" will also be read.

AIR MINISTRY LIBRARY.—Permission has been obtained from the Air Council for technical members of the Society to use the Air Ministry Library for reference purposes on production of letters of introduction signed by the Secretary of the Society. Any members desiring to avail themselves of this privilege should therefore apply to the Secretary for a formal letter of introduction.

ANNUAL DINNER.—It is proposed to hold the first annual dinner of the members of the Society during the month of October next. Members who anticipate being able to be present will assist in making the necessary arrangements if they will communicate the fact to the Secretary at an early date.

W. LOCKWOOD MARSH,
Secretary.

July 16th, 1920.

THE ROYAL AERO CLUB.

AERIAL DERBY HANDICAP.

(Course, 205 miles.)

1. *Entrant*—Bert Hinkler. *Pilot*—Bert Hinkler. *Aircraft and Engine*—Avro "Baby," 35-h.p. Green. *Handicap*—1 hr. 41 min. *Starting Time*—2.15 p.m.
2. A. V. Roe and Co., Ltd. Capt. H. A. Hammersley, M.C. Avro "Baby," 35-h.p. Green. 1 hr. 34 min. 2.22 p.m.
3. Leth Jensen. Leth Jensen. S.P.A.D. "S.29," 80-h.p. Le Rhone. 45 min. 3.11 p.m.
4. F. S. Cotton. F. S. Cotton. D.H.14a, 450-h.p. Napier "Lion." 40½ min. 3.15½ p.m.
5. Lieut.-Col. F. K. McClean. Capt. W. L. Jordan, D.S.C., D.F.C. Sopwith "Snipe," 200-h.p. B.R.2. 28 min. 3.28 p.m.
6. Major-Gen. the Rt. Hon. J. E. B. Seely, Col. Ivan Davson, Capt. Sir John C. E. Shelley-Rolls. Flight Lieut. W. H. Longton, D.F.C. Sopwith "Snipe," 200-h.p. B.R.2. 28 min. 3.28 p.m.
7. Flight Lieut. J. S. T. Fall, R.A.F. Flight Lieut. J. S. T. Fall, R.A.F. Sopwith "Snipe," 200-h.p. B.R.2. 28 min. 3.28 p.m.
8. A. V. Roe and Co. Ltd. Capt. D. G. Westgarth-Heslam. Avro "Schneider," 230-h.p. Siddeley "Puma." 16½ min. 3.36½ p.m.
9. [Entry withdrawn.]
10. The "Nieuport" and General Aircraft Co., Ltd. John Herbert James. Nieuport "Nighthawk," 320-h.p. A.B.C. "Dragonfly." 12 min. 3.44 p.m.
11. Martinsyde, Ltd. R. H. Nisbet. Martinsyde "F.6," 300-h.p. Hispano-Suiza. 11½ min. 3.44½ p.m.
12. Squad. Leader T. O'B. Hubbard, M.C., R.A.F. Squad. Leader T. O'B. Hubbard, M.C., R.A.F. Martinsyde "F.4," 300-h.p. Hispano-Suiza. 10½ min. 3.45½ p.m.
13. Sopwith Aviation and Engineering Co., Ltd. H. G. Hawker. Sopwith A.B.C., 320-h.p. A.B.C. "Dragonfly." 9 min. 3.47 p.m.
14. Bristol Aeroplane Co., Ltd. C. F. Uwins. Bristol "Bullet," 450-h.p. Bristol "Jupiter." 7½ min. 3.48½ p.m.
15. Martinsyde Ltd. F. P. Raynham. Martinsyde "Semiquaver," 300-h.p. Hispano-Suiza. 1 min. 3.55 p.m.
16. The "Nieuport" and General Aircraft Co., Ltd. L. R. Tait Cox. Nieuport "Goshawk," 320-h.p. A.B.C. "Dragonfly." Scratch. 3.56 p.m.

OFFICIALS.

Judge.—Brig-Gen. Sir Capel Holden, K.C.B., F.R.S.

Stewards.—Air Vice-Marshal Sir John Salmond, K.C.B., C.M.G., C.V.O., D.S.O.; Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.; Lieut.-Col. John D. Dunville.

Clerk of Course.—Col. F. Lindsay Lloyd, C.M.G., C.B.E. (*Assistant*: B. Stevenson.)

Handicappers.—Wing-Commander E. F. Briggs, D.S.O., R.A.F.; Squadron-Leader T. M. Barlow, R.A.F.; Squadron-Leader R. M. Hill, R.A.F.

Timekeepers and Starters.—A. G. Reynolds; T. D. Dutton.

Marshals.—Howard T. Wright (Chief Marshal); Capt. W. G. Aston; Commander W. Briggs, R.N.; Lieut.-Col. W. A. Bristow; Major Ap. Ellis; Flight Lieut. V. Greenwood, R.A.F.; C. G. Grey; Capt. W. E. Holland; Capt. L. F. Jones; Major J. H. Ledeboer; Capt. J. M. MacAlery; Major G. McCall; Lieut.-Col. W. Lockwood Marsh; Major R. H. Mayo; D. W. Thorburn; Major J. H. Tyler; J. E. Withers; Major W. E. de B. Whittaker.

Observers at Turning Points.—A. J. A. Wallace Barr; T. D. L. Brotherstone; Capt. R. L. Charteris; Major B. M. Dodds; B. Faulkner; Capt. C. L. E. Geach; Henry Knox; Capt. D. G. Murray; Henry Webb.

Honorary Surgeon.—Major H. Graeme Anderson, R.A.F.

Committee of Management.—G. B. Cockburn; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.; Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F.; Bernard Isaac and Harold E. Perrin, Organising Secretaries.

FLYING SERVICES FUND.

Subscriptions.—Total subscriptions to June 28th, 1920—£17,138 10s. 2d. Major P. Litherland Teed (6th contribution), £3 3s.; half the proceeds of a Charity Matinee given by the Flowerdown Amateur Dramatic Society, of Headquarters, No. 1 (T.), Wireless School, Winchester, £6 12s. 10d. Total, July 20th, 1920, £17,148 6s.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

MILITARY

WAR OFFICE, July 16th.

The names of the following have been brought to the notice of the Secretary of State for War by Maj.-Gen. H. C. Holman, K.C.B., C.M.G., D.S.O., for valuable and distinguished services rendered with the British Military Mission in South Russia. Dated March 15th, 1920:—

Allsebrook, Flight Officer H., R.A.F.; Archer, Sqdn. Ldr. J. O., O.B.E., R.A.F.; Bourne, F./Off. (A.Capt.) W., R.A.F.; Edwards, F./Lt. H., R.A.F.; Fulford, F./Off. E., R.A.F.; Fulton, F./Off. D. B. C., R.A.F.; Harrison, F./Off. (A./Capt.) W. H., R.A.F.; Holder, F./Off. V., R.A.F.; Mitchell, Obsr./Off. J., R.A.F.; Smith, Flt. Lt. W. S. C., R.A.F.; Terry, Flt./Lt. E. P., R.A.F.

AIR FORCE.

AIR MINISTRY, July 6th.

ROYAL AIR FORCE.—FLYING BRANCH.—Pilot Officer to be Flying Officer:—E. G. Breen, Feb. 29th.

Flying Officer G. E. Creighton is placed on the half-pay list (Scale B), July 4th.

ADMINISTRATIVE BRANCH.—Pilot Officer to be Flying Officer:—J. H. Woodgett, Oct. 1st, 1919.

TECHNICAL BRANCH.—Pilot Officer A. H. Harrison to be Flying Officer, Oct. 1st, 1919.

AIR MINISTRY, July 9th.

R.A.F.—PERMANENT COMMISSIONS.—Flying Officer W. H. Ellison (T.) is granted a permanent commn. in the rank stated, with effect from Aug. 1st, 1919 (substituted for notification in "Gazette," July 2nd, but does not affect notification in "Gazette," Nov. 28th, 1919)

Flight Lt. A. M. Waistell, D.S.C., relinquishes his commn. on account of ill-health, and is permitted to retain his rank, July 10th.

SHORT SERVICE COMMISSIONS.—Flight Lt. A. S. Goodwin (T.) is granted a short service commn. in the rank stated, with effect from July 9th.

The following temp. appts. are made at the Air Ministry:—

Deputy Directors.—Lt.-Col. C. L. Courtney, C.B.E., D.S.O., from Director; Lt.-Col. A. Fletcher, C.B.E., M.C., from Director, May 1st, 1919.

FLYING BRANCH.—Flight Lt. J. C. Brooke, D.S.C., is restd. to the Active List, Dec 1st, 1919

Flight Lt. J. C. Brooke, D.S.C., is placed on the half-pay list (Scale A), Aug. 7th, 1919.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATHS.

ILLINGWORTH.—Capt. M. Oswe Illingworth, R.A.F., who died on July 15th after a lingering illness contracted on active service, August, 1914—April, 1919, was the son of Ebenezer Illingworth, of Cape Town (late of Bradford), and only brother of Elsie Illingworth, 55, Upper Addison Gardens, W.14. He was 39 years of age.

MACQUEEN.—Flt. Officer Alexander J. Macqueen, R.A.F., of No. 12 Squadron, aged 25, son of Mr. J. Macqueen, Shanklin, Isle of Wight, was killed while flying near Cologne on July 5th.

MARRIAGES.

BARNARD—PAYNE.—On July 10th, at Wallington, by the Rev. W. Hardy Harwood, F. Leslie Barnard to Ethel (Pat) Payne.

FOSTER—ANNE.—On July 1st, at the Brompton Oratory, Major John B. Foster, eldest son of the late Leonard Foster, of Kirklington Hall, Notts., was married to Mrs. Crathorne Anne, widow of Major Crathorne Anne, of the Royal Flying Corps, by the Rev. John Talbot.

LIVINGSTON—LEGASSICKE-CRESPIN.—On July 8th, at St. Mary Abbot's, Kensington, Flight Lt. Philip Clermont Livingston, R.A.F., M.S., B.A. Cantab., M.R.C.S., D.P.H., son of the late Mr. Clermont Livingston, of Cowicham Lake, Vancouver Island, and Mrs. Livingston, 28, FitzJames Avenue, West Kensington, was married to Lorna Muriel, only daughter of Mr. and Mrs. Legassicke-Crespin, late of 51, West Cromwell Road, Kensington, and Modbury, Devon, by Prebendary Eardley-Wilmot.

LOCKYER—MEASURES.—On July 1st, at St. Etheldreda's Church, Hatfield, Clarence Edward Williams Lockyer, R.A.F., only son of J. E. Lockyer, A.M.I.C.E., of Kingsbridge, was married to Dorothy Rebecca, elder daughter of J. Measures, of Roe Green, Hatfield.

MEERS—GUNN.—On July 6th, at Saint George's, Bickley, Rupert Hart Meers, late Capt., R.A.F., M.A., of Chiselhurst, was married to Alice Norah Gunn, daughter of the late W. Cecil Gunn, and of Mrs. Gunn, of the Red House, Bickley, Kent, by the Rev. Canon W. A. Carroll, M.A.

MOSSOP—MARETT.—On July 12th, 1920, at St. Heliers Parish Church, Jersey, Edward Ashort Mossop (late Capt., R.A.F.), son of Mr. and Mrs. Charles Mossop, of St. Helier, Jersey, was married to Nellie de Carteret, only daughter of Mr. E. G. Marett and the late Mrs. Marett, of Grouville, Jersey, by the Very Reverend the Dean of Jersey.

OXENHAM—GRUNOW.—On July 14th, at St. George's Church, West Hartlepool, Arthur Hugo Gordon Dunkerley, late R.A.F., youngest son of John Oxenham, Ealing, was married to Elsie, second daughter of Mrs. Grunow, of Avenue Road, West Hartlepool.

TRENCHARD—BOYLE.—The marriage took place on July 17th, at St. Margaret's, Westminster, of Air-Marshal Sir Hugh Montagu Trenchard, Bt., K.C.B., D.S.O., Chief of the Air Staff and Colonel of the Royal Scots Fusiliers, and Katharine, widow of Captain the Hon. James Boyle, Royal Scot Fusiliers, and second daughter of the late Mr. Edward Salvin Bowlby, of Gilston Park, Herts, and of Knoydart, Inverness-shire, and of Mrs. Salvin Bowlby, of 56, Lowndes Square.

The Rev. Harry Dan Leigh Vieuer, Chaplain of the Air Force, officiated, assisted by the bride's cousin, the Rev. Henry Thomas Bowlby, Headmaster of Lancing College. The Hon. Maurice Baring was best man.

The ushers were Air-Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., Air-Commodore C. A. H. Longcroft, C.M.G., D.S.O., A.F.C., Group-Captain A. M. Longmore, D.S.O., Group-Captain C. L. N. Newall, C.M.G., C.B.E., A.M., and Captain T. B. Marson, M.B.E.

The following were among those who attended the church:—

Mr. and Mrs. Churchill, the Marquess of Londonderry with his two younger daughters, Lady Desborough, Viscount Cowdray, General Duval, Chief of the French Air Service, the Earl and Countess of Kenmare, the Earl and Countess of Cassillis, the Earl and Countess of Dunmore, the Earl of Cranbrook, Lady Keyes, Lord Stanmore, Lord Hugh Cecil, Lieut.-General Sir John and Lady Birch, Mrs. Salvin Bowlby, the bride's mother, Sir Anthony and Lady Bowlby, Col. G. H. Agnew, D.S.O., Mrs. Cracroft Amcotts, General and Mrs. Hastings Anderson, Maj.-General Sir Frederick and Lady Sykes, Mr. Edward Trenchard, the Hon. Mrs. Geoffrey Bowlby, Wing-Comm. the Hon. John and Mrs. Boyle, the Hon. Alan and Mrs. Boyle, Col. and Mrs. Douglas Brownrigg, Lieut.-Col. and Mrs. Buchanan, Lieut.-Col. George and Mrs. Ferguson Buchanan, Lieut.-General Sir Philip and Lady Chetwode, Major and Mrs. Arthur Dorrien-Smith, Major and Mrs. Edward Dorrien-Smith, Lieut.-

General Sir John and Lady Du Cane, Capt. and Mrs. Eastwood, the latter a sister of the bridegroom, Sir Walter and Lady Egerton, Air Vice-Marshal and Miss Ellington, Col. F. H. Errington, Air-Commodore and Mrs. Fell, General Sir Charles and Lady Alice Fergusson, Admiral Sir James and Lady Fergusson, Lieut.-General Sir G. H. and Lady Fowke, the Hon. Edward Gathorne-Hardy, the Hon. Robert Gathorne-Hardy, Lady Jane Gathorne-Hardy, Lady Gough, Air Vice-Marshal and Mrs. Higgins, General F. F. and Mrs. Hill, Col. the Hon. A and Mrs. Hore Ruthven, Brig.-General and Mrs. Jeffreys, Lady Doris Greene Kelly, Rear Admiral Sir Cecil and Lady Lambert, Maj.-General Sir F. Maurice, Brevet-Col. O. H. and Mrs. Delane Osborne, Air Commodore Pitcher, Brig.-General and Mrs. Pollard, Sir Walter and Lady Raleigh, Lieut.-Col. and Mrs. Moore-Brabazon, General and Mrs. de Rougemont, Wing-Com. Sir H. A. van Ryneveld, Lady Salmond, Air Vice-Marshal Sir J. Salmond, Brig.-General and Mrs. Scudamore, Maj.-General Seely, Air Commodore and Mrs. Game, Air Commodore and Mrs. Lambe, Air Commodore and Mrs. Steel, Group-Capt. Halahan, Group-Capt. and Mrs. Smyth Osbourne, Group Capt. and Mrs. Bonham Carter, Wing Comm. and Mrs. Heseltine, Wing-Comm. and Mrs. J. C. Halahan, Wing Comm. and Mrs. Rankin, Wing Comm. Wynn, Wing Comm. Godman, and a large number of flying officers, officers and officials of the various departments of the Air Ministry, and officers of the 1st Battalion of the Royal Scots Fusiliers and the Royal Scots Fusiliers' depot at Ayr.

On leaving the church Air Marshal and Lady Trenchard were played past the R.A.F. guard of honour by the pipers of the Royal Scots Fusiliers.

ENGAGEMENTS.

HORSFIELD—MUIR.—A marriage has been arranged, and will shortly take place, between Capt. H. T. Horsfield, A.F.C., R.A.F., and Lily, daughter of the late J. W. Muir, I.C.S., of 7, Queen's Gate Gardens, S.W.

MONTAGU—CRAKE.—The marriage arranged between Miss Pearl Crake and Lord Montagu of Beaulieu will take place at 2.15 at St. Margaret's, Westminster, on Tuesday, Aug. 10th.

NICHOLSON—SCOTT.—An engagement is announced, and a marriage will shortly take place, between Mr. J. J. W. Nicholson, D.F.C., R.A.F., and Kathleen Maud, second daughter of the Rev Canon and Mrs. Scott, of Douglas Rectory, Co. Cork.

PORRI—CANONNE.—A marriage has been arranged, and will take place at the Cathedral, St. Omer, between Flight Lt. C. Porri, M.A., Barrister-at-Law, and Mlle. Jeanne Marie Canonne, younger daughter of Mme. Canonne and the late M. Léon Canonne, Officier de l'Ordre de Nichan Pftikar (Tunis), of St. Omer, Pas de Calais, France.

BIRTHS.

BOURKE.—On July 5th, at a nursing-home in Grantham, wife of Group Capt Bourke, R.A.F.—a daughter.

COURTNEY.—On July 4th, at Hasledeane Lodge, Camberley, the wife of Wing Comdr. I. T. Courtney, R.A.F. (late R.M.L.I.), of a son.

GRIFFITH.—On July 13th, at 8, Foulis Terrace, Onslow Square, to Bluebell, wife of Capt. Edward Noel Griffith (late R.F.C.)—a daughter.

MALET.—On June 21st, at the Mill House, Sheet, Petersfield, Olga Muriel, wife of Flight Lt. H. G. R. Malet, R.A.F., of a son.

MILEY.—On July 11th, at St. Mary Bourne, the wife of Sqdn. Ldr. A. J. Miley, O.B.E., R.A.F., of a daughter.

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COMING EVENTS.

JULY.

17th, Sat.-29th, Thurs.—Antwerp Seaplane Meeting.
24th, Sat.—Aerial Derby at Hendon.

AUGUST.

3rd, Tues.—British Government Competition, large and small type Aeroplanes, at Martlesham Heath.
25th, Wed., 26th, Thurs.—R.A.F. *v.* Army Cricket Match at the Oval.
28th, Sat., 29th, Sun.—Schneider Cup Race at Venice.

SEPTEMBER.

1st, Wed.—British Government Competition, Amphibian Competition at Felixstowe.
8th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva
27th, Mon.—Gordon Bennett Aviation Cup Meeting near Paris begins. Day to be announced.—Lake Garda International Seaplane Race.

OCTOBER.

2nd, Sat.—Gordon-Bennett Aviation Cup Meeting near Paris closes.
23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.

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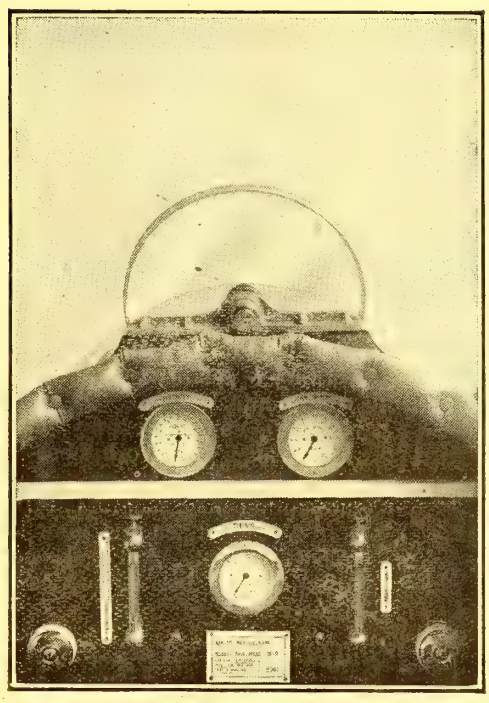

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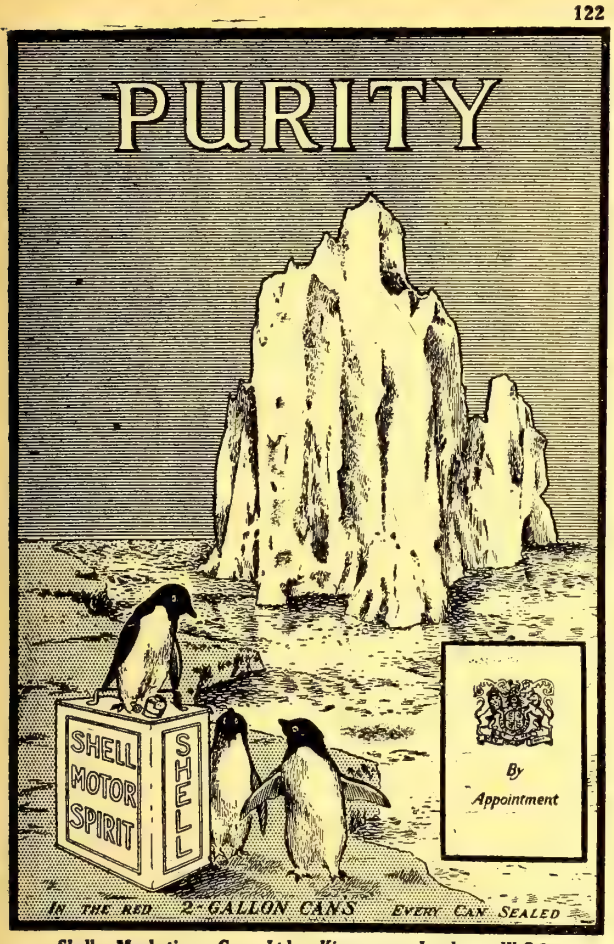

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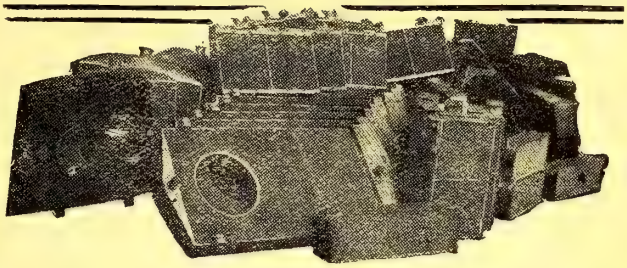

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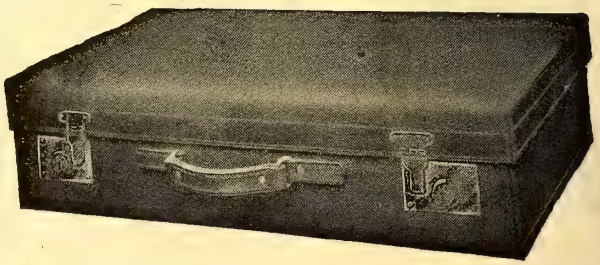

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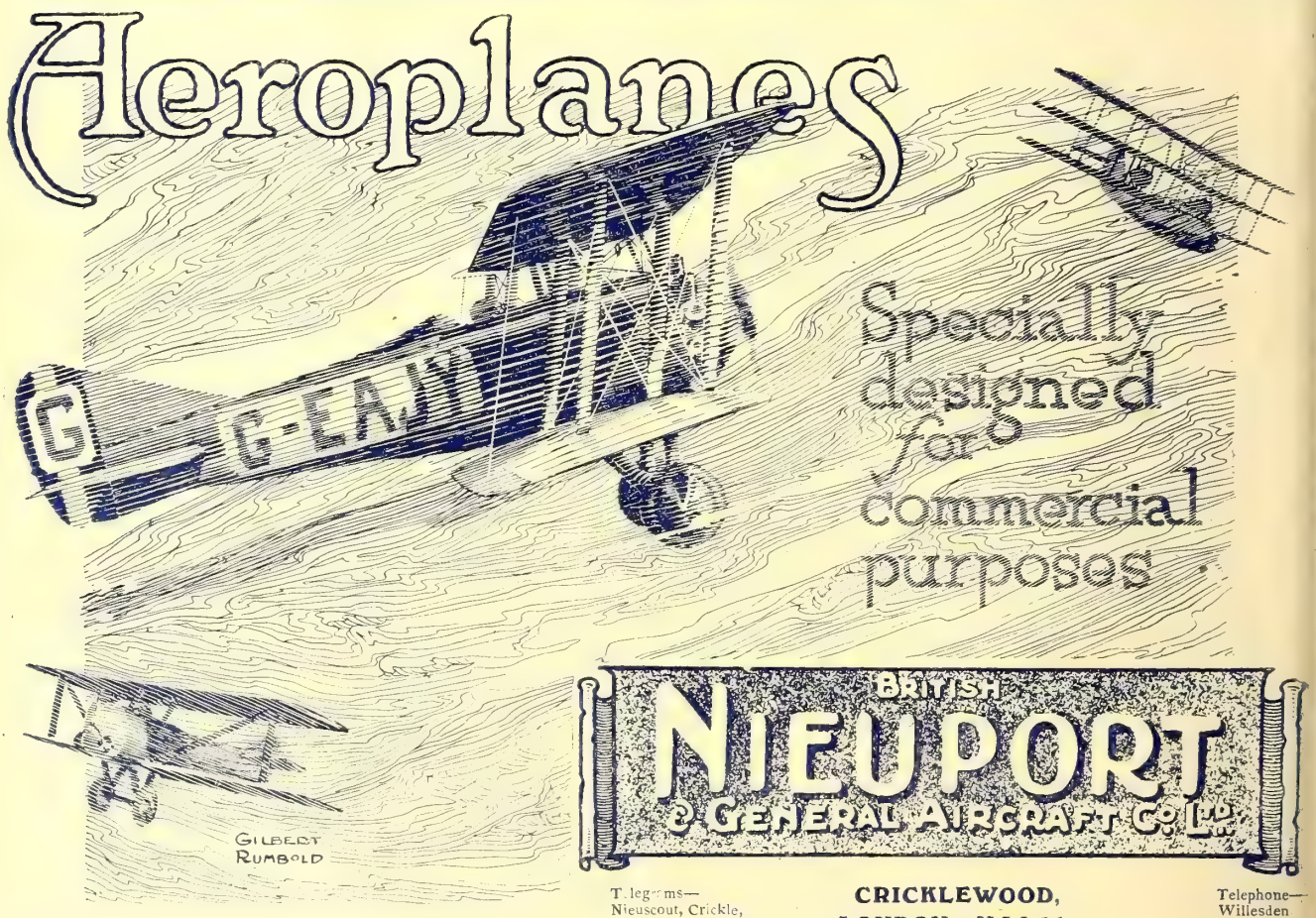

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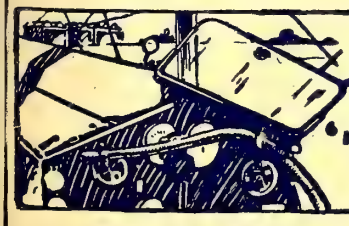

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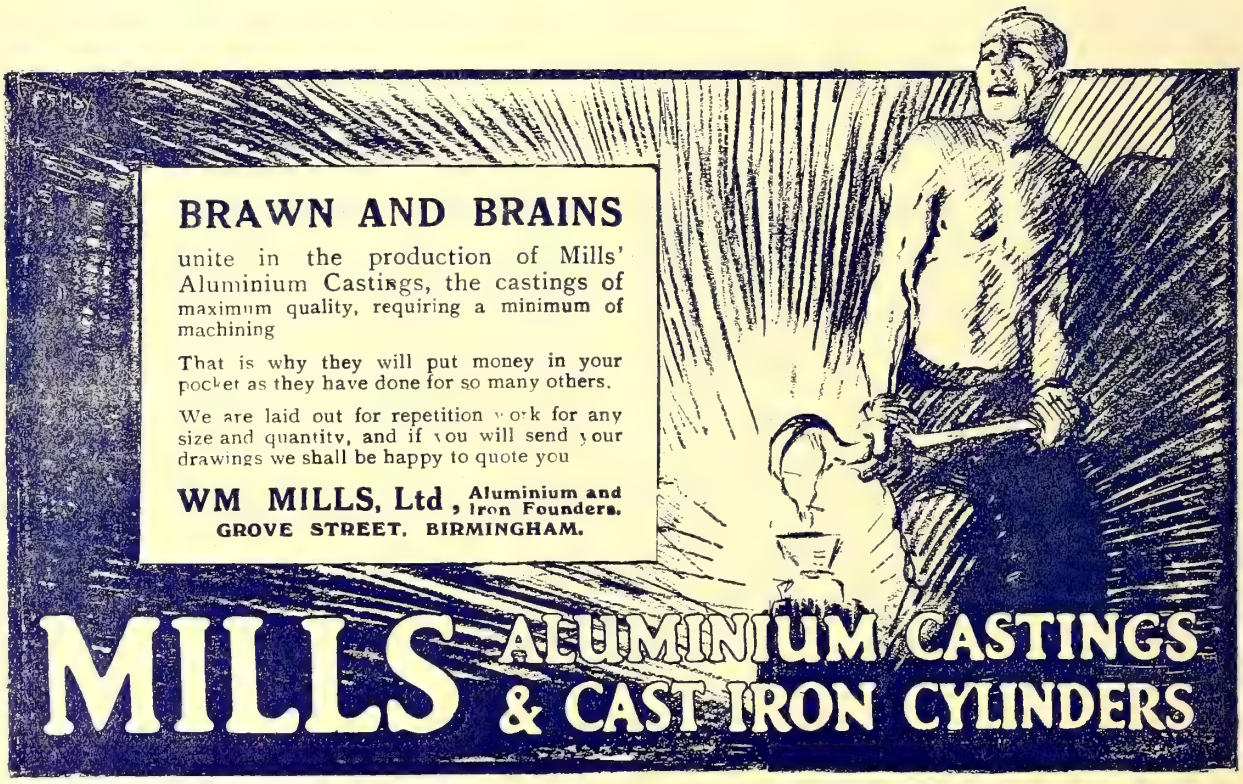

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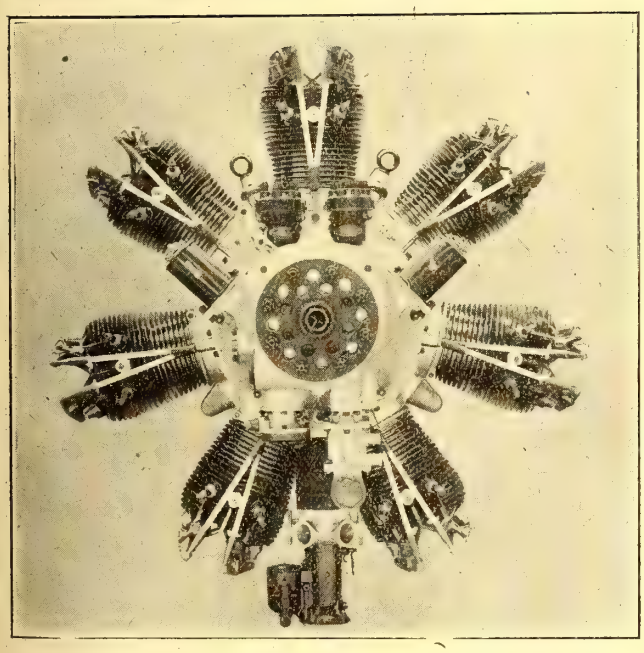

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JULY 28, 1920.

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ON THE AERIAL DERBY.

On the whole the Aerial Derby, flown on Saturday last, July 24th, may be written down a pronounced success. The Committee of the Royal Aero Club, taught a severe lesson by the Schneider Cup fiasco last September, had organised the whole affair properly, or perhaps it would be more correct to say that the Committee "did nothing in particular and did it very well," while people who know something about organisation were given a free hand to run the show. In any case, the whole organisation ran like a clock, partly because the scheme of operations was good and partly because intelligent people were chosen to operate the scheme.

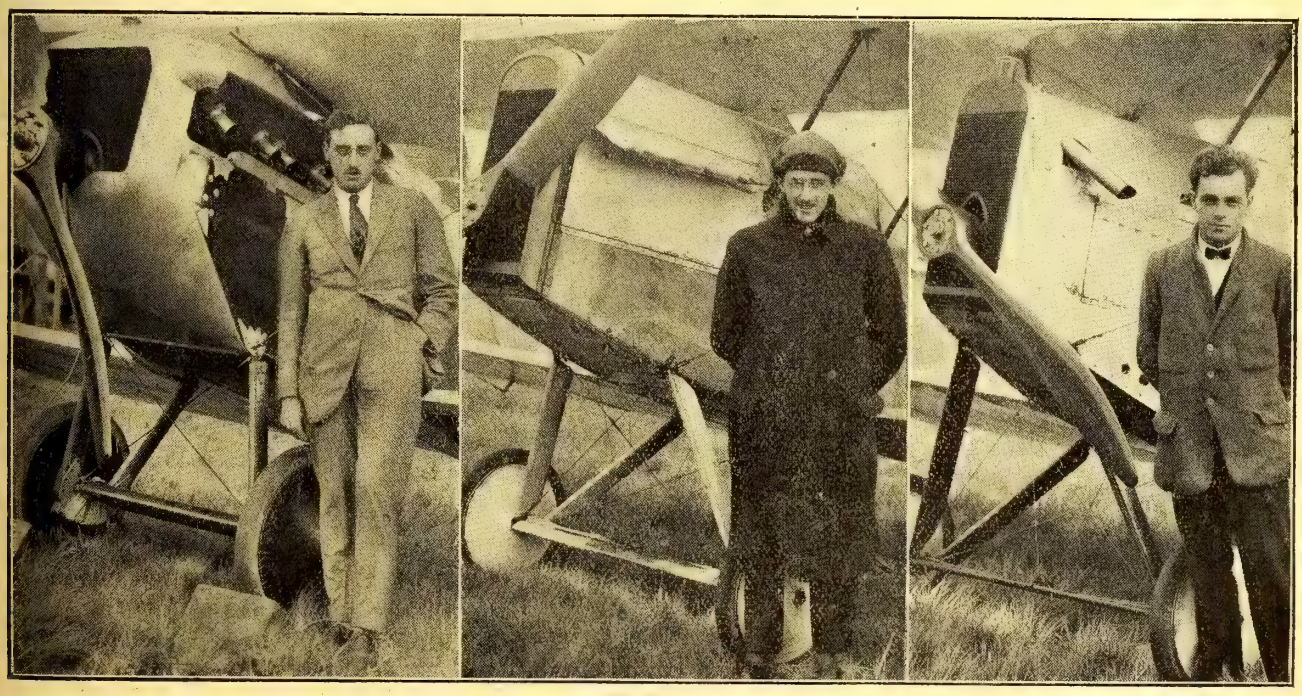
The daily newspapers did their silly best to advertise the affair, and succeeded in producing as usual a series of glorious howlers, either actually written by their tame "experts" or worked into otherwise intelligent articles by the fatuous asses who are employed as editors and sub-editors in the environs of Fleet Street. Such little ingenuities as turning the "Baby" Avro into a "Davy" Avro and fitting a Bristol "Bullet" with a 450-h.p. Napier engine were among the minor achievements of the Press.

In no paper did one see an intelligent explanation of the programme, as, for example, that the Aerial Derby as such was quite distinct from the Handicap Race. In fact on Saturday evening one prominent paper announced Captain Hamersley as the winner of the Derby. Nor did one see anything in any paper calculated to interest the public either in the race or in the individual competitors. What matter the papers did print about the race was chiefly of the species commonly known as "guff." And yet people went to Hendon in their thousands.

Popular Interest.

At a rough guess one would say that there were between 10,000 and 12,000 people present. It was a long crowd, but, as a member of it remarked, it was a draughty crowd, in that it was not packed so tight as to afford shelter from the biting breeze to those in the leeward ranks. That means that there were probably more people at Hendon on Saturday afternoon than there were at Olympia during the whole ten days of the Aero Show—allowing for the fact that a large proportion of the visitors to Olympia were professionally concerned with aviation and had to go there over and over again whether they liked it or not.

Also the weather on Saturday was perfectly hopeless early in the morning, and distinctly threatening till after the race had actually started. Added to which there was a cold blusterous wind which certainly did not tempt people to go and stand out in the open unless they were quite enthusiastic. If Saturday had been a real Summer day there would have been at least twice as big a crowd, or even bigger. All of which goes to show that people really are keenly interested in flying although they may not be so interested in aeroplanes.



THE WINNERS:—Left to right—Mr. F. T. Courtney (winner of the Aerial Derby and third in the Royal Aero Club Handicap); Captain H. A. Hamersley, M.C. (winner of the R.Ae.C. Handicap); and Mr. Bert Hinkler (second in the R.Ae.C Handicap).

The Start.

The race started absolutely according to the programme, when Mr. Bert Hinkler, the limit man, was started at 14.15 hours. Thanks to the organising by Mr. Howard Wright of the "Acting Temporary Air Marshals," as a humorist called the marshals of the course, every man was on his mark well in front of time. After which Colonel Lindsay Lloyd, as Clerk of the Course, and Mr. Reynolds, as Starter and Timekeeper, saw to it that they all went off on time.

Mr. Hinkler's marshal was warned beforehand that he must not, as in whippet-racing, hold the competitor up by the tail and throw him across the line at the fall of the flag. Nevertheless, the "Baby" Avro got well away at the signal, lifted quickly against the strong wind, took a series of nasty bumps passing over the sheds, and headed on a good line for Brooklands.

Captain Hamersley's "Baby" was steadier in starting, possibly owing to his higher speed, and his engine seemed to have a better note than Mr. Hinkler's.

The next man due to start—at 15.11—was Mr. Leth Jensen, but as he did not arrive from France nothing happened till 15.15½, when Mr. F. S. Cotton's colossal D.H.14a was dispatched. It sailed off with much grandeur, and made a good line for Harrow Church, which is more on the course for Oxford than for Brooklands. But Mr. Cotton, good sportsman that he is, being used to navigating in continents rather than in parishes, seemed indifferent to a mile or two or ten, and ultimately fetched round the course in very good time.

Then came the most impressive start of the lot, when the three Sopwith "Snipes," piloted by Squadron Leader Fall, Flight Lieut. Longton, and Captain Jordan, were sent off together, all being on the 28-minute mark.

Squadron Leader Fall was suffering from a badly-damaged knee, having hit it with his airscrew when starting up his engine the day before, but he gamely insisted on flying in the race. All three of these competitors were particularly interesting, in that they were purely amateur entries. Squadron Leader Fall was flying entirely at his own expense. Flight Lieut. Longton was piloting the machine entered in a truly sporting spirit by Major-General Seely, Colonel Davson, and Sir John Shelley Rolls, all prime movers in the Air League. And Captain Jordan was flying Mr. Frank McClean's entry. It is a pity that such sporting competitors did not have better luck.

As they were put on the line they seemed dangerously close together for a unanimous start. If one of them had swerved there might have been a wholesale crash and a big fire. Therefore Colonel Lindsay Lloyd and Mr. Howard Wright had them moved farther apart.

When the flag fell at 15.28, Capt. Jordan was first away, followed by Sqdn. Leader Fall. Flight Lieut. Longton's engine choked a little as he opened out, and he actually left the ground several seconds behind them. But the two leaders headed too far to the west, and long before they were out of sight Flt. Lieut. Longton was heading them on a bee-line for Brooklands.

The Speed Machines.

After the "Snipes" went Captain Westgarth-Heslam on the "Schneider" Avro, which scuttled along the ground like a scalded cat and shot off across the houses at an amazing pace. She was the first machine of the day to give a real impression of speed. This may have been due partly to her small size, but it was also because she really is fast.

With floats she has been timed to do 136 miles an hour, and though floats are not so much slower than wheels as many people think, she is certainly a good deal faster than that in her present "tuned" condition. On the Friday, coming up from Winchester to Hendon, a matter of 70 miles, admittedly with a howling gale behind him, Captain Heslam's time was 18 minutes from the time of leaving the city to the time of sighting the aerodrome, so that the "Schneider's" speed must be somewhere near the 150-m.p.h. mark.

If only he had stayed the course he would have put up a wonderful performance, but he never appeared again, and later it was learned that he had come down near Epping for some unknown reason.

One learned on Monday that Captain Heslam's stop at Abridge, near Epping, was caused by something going wrong with his petrol supply with the result that most of his 25 gallons of petrol were distributed over his person instead of going through the engine. He had made astonishingly fast time up to that point, and he said afterwards that his Siddeley "Puma" was one of the sweetest running engines that he had ever sat behind. One hopes to see him and this interesting little machine, with a revised petrol system, doing themselves justice on another occasion.

The next competitor due to start was Mr. J. H. James on the Nieuport "Nieuhauk." Owing, apparently, to not warming up sufficiently before-hand, his engine stopped when it was opened out. When it was got going again it ran for a moment or two and then stopped again because the petrol was turned off. Finally he got away after the two Martinsydes, and did very well so far as sheer speed was concerned.

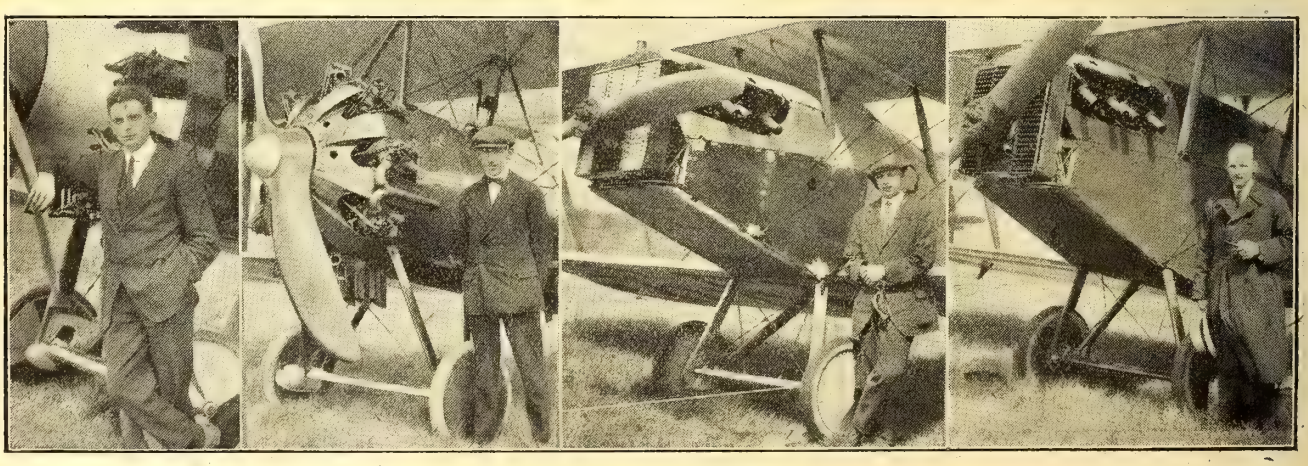
Mr. R. H. Nisbet on the "F.6" Martinsyde was the next away. His start was quite uneventful, as was that of Squadron Leader T. O'B. Hubbard on the "F.4," which was set to give a start of a minute to the "F.6." Both are veterans among pilots, and their faultless handling of their machines showed that flying is by no means a game for young men only.

Mr. Hawker's start on the Sopwith "Rainbow" was watched with much interest, for, like the "Schneider" Avro, this was a float machine transferred to a wheeled undercarriage. Also she had an A.B.C. engine instead of her original Cosmos "Jupiter." She got away well and was obviously very fast.

Then came Mr. Uwins on the Bristol "Bullet," the first appearance of the "Jupiter" since that promising engine was taken over by the Bristol Company. The "Bullet" is a very big machine for a single-seater and her size detracts from the impression of speed, but to the experienced eye there was no doubt that the speed was there.

The next to go was Mr. Frank Courtney on the record-breaking Martinsyde "Semi-Quaver," her first public appearance in the air. Mr. Courtney's was a fine effort, for he was deputising for Mr. Raynham, who had injured his shoulder six days before through landing an "F.4" on a camouflaged mowing-machine at Brooklands. Mr. Courtney had only flown the "Semi-Quaver" once before, and that was on the previous day. He had come straight onto this tiny machine from twin-engined Boulton-and-Pauls and such large craft. Nevertheless he made an excellent start, in spite of bumping once or twice after his first lift.

The last machine to leave, one minute after the Martinsyde, was the Nieuport "L.S.3," piloted by Mr. Tait-Cox, from the scratch mark. This also was the first public appearance of a record-breaker, and from the astonishing speed with which she disappeared from sight it was evident that, all being well, there was going to be a big fight between the two back-markers. But she was not seen again, for she landed at Brooklands a few minutes after starting.



OTHER COMPETITORS:—Left to right—Mr. J. H. James (Nieuport); Mr. C. F. Uwins (Bristol); Mr. R. H. Nisbet (Martinsyde); and Sqdn. Ldr. T. O'B. Hubbard (Martinsyde).

The First Round.

Meantime, just after Captain Heslam had started, and while Mr. James was getting ready to start, the two Avro Babies appeared together at the end of their first round. Captain Hamersley had picked up his eight minutes on Mr. Hinkler and was leading him by half a minute, their times of arrival being 15.38 and 15.38.33 respectively. Both took the corners round the pylons faultlessly, in the best style of pre-war Hendon flying.

Their times showed that the high wind had made much less difference to their speed than was expected. Captain Hamersley's machine was known (though not apparently to the handicappers) to do 84 miles an hour, and his speed for the lap worked out at just about 79 miles an hour, so the pair must have flown an almost perfect course. Mr. Hinkler said before he started that he was going tree-scraping all the way along the stretches where the wind was against him, so as to avoid being blown backwards. It seems that they must have flown under the lee of the houses in some places to make such time.

After the scratch man had started there was a wait of less than 15 min., and then, at 16.10.43, Mr. Cotton appeared high up and rather wide, his big Napier singing joyously that deep-throated song which is so charming to the ears of all who love engines. And that was the last seen of him. Later it was reported that he had landed at Hertford, abolished a hedge, and pushed his engine into a cornfield. Mr. Cotton does not have much luck, for the race was a gift to him if he had stayed the course.

Three minutes after Mr. Cotton left, and while he was still in sight, two of the "Snipes" appeared together. Flight Lieut. Longton was leading by three seconds, with Captain Jordan sitting on his tail as if he had been a Hun. The two swept round the pylons low down and close in, so they made a very impressive sight. It was not till some time later that it became known that Squadron Leader Fall had come down at Hertford with magneto trouble.

The story of the three Snipes is peculiarly interesting. Squadron Leader Fall's machine let him down at Hertford because the magneto driving gear on his B.R. engine slipped or stripped—it is not yet certain which—and threw his magneto out of action. His engine was running beautifully and he had not opened his throttle to the full, so he would have had plenty of petrol to finish the course.

Flight Lieut. Longton's engine, on the other hand, was not doing well. So much was fairly evident at the start. Also he had a small pitch airscrew, suitable for lifting a full war load. To go the pace of the other two he had to run his engine at a very high number of revolutions per minute with the throttle fully open, under which conditions the petrol consumption of the B.R. engine goes up and the power comes down.

Captain Jordan, being very wily, borrowed an enormous airscrew of high pitch and about ten feet in diameter, quite unsuitable for a war load, but eminently fitted to pull a light machine very fast at a low rate of engine revolutions. Consequently he was running his engine comparatively slowly with the throttle wide open, under which conditions the B.R. engine is fairly economical. Flight Lieut. Longton could probably have beaten him on a climb, but Capt. Jordan would have had the best of it on pure speed.

After them came a gap of ten or twelve minutes before two more machines hove in sight. The first to arrive was Mr. James, at 16.28.21, on the Nieuport, having caught and passed the two big Martinsydes. He came in low down, and for some reason best known to himself, flew two laps of the pyloned course in excellent style. Only ten seconds behind him and high up was Mr. Hawker, going very strong. As he did only the statutory one lap of the aerodrome he was out and away while Mr. James was half way round his self-imposed second lap.

Before they were out of sight Mr. Nisbet came in at 16.31 on the F.6 Martinsyde, took his corners wide and high, and went off on a good course.

Three minutes later, at 16.34.25, Mr. Courtney appeared, travelling, as a spectator remarked, "at a hell of a lick," having passed the Bristol and Squadron Leader Hubbard's Martinsyde, and looking in a good way to catch everybody else except the Avros.

At 16.37.16 Mr. Uwins crossed the line on the Bristol, going quite well, but, one imagines, not running his engine all out.

Last of all to finish the first circuit came Squadron Leader Hubbard, at 16.40.50, having lost ground to Mr. Nisbet's F.6, which is actually a slower machine. The original F.4 which he was to fly was the one which Mr. Raynham landed on the mowing machine at Brooklands. It was completely written off, and the machine he was flying was taken out of stock, so it was practically untuned. Hence the discrepancy in time.

The Finish.

There was quite a short wait between the passing of Squadron Leader Hubbard's Martinsyde and the arrival of the winner of the Handicap. Captain Hamersley crossed the finishing line at 16.54.6. Six minutes later, amid further demonstrations of joy from the Avro-Green partisans, Mr. Hinkler came in, crossing the line at 17.00.46.

The two Avro pilots landed beautifully, were duly seized by admirers, photographed, and transported along the front of the cheering crowd in a big car, directed by Mr. Bernard Isaac.

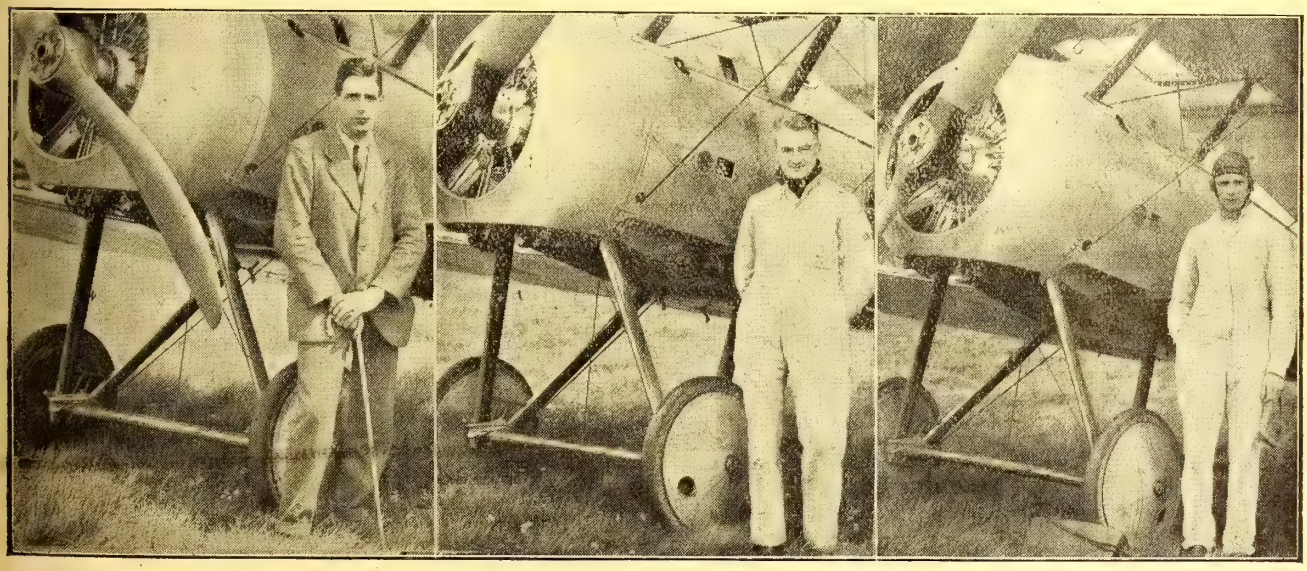
While they were being exhibited Mr. Hawker came in, about ten minutes later, but instead of crossing the line and securing third place in the Handicap and a certain second place in the Aerial Derby, he flew across the aerodrome at right angles to the crowd, turned somewhere over the Grahame-White Palais-de-Dance at the back of the sheds, came into the aerodrome again and made an excellent landing. Evidently he had made some curious mistake about the rules, and so once more escaped winning a prize. Afterwards it was reported that he had not been observed at all the turning-points, so the final mistake did not affect the results and actually saved a good deal of argument.

It was a pity, for his first lap was done in 41 min. 31 sec.

Friends rushed out to tell him to get up again and fly over the line. But it was too late. Before he could get going another machine hove in sight.

The Derby Winner.

The arrival proved to be Mr. Courtney on the "Semi-Quaver." He crossed the line at 17.13.12, having caught and passed everybody except the two Babies. He had failed to catch Captain Hamersley by 29 min., so to give him the



THE SOPWITH "SNIPE" PILOTS :—Left to right—Squadron Leader J. S. T. Fall, D.S.C., A.F.C.; Flight Lieut. W. H. Longton, D.F.C., A.F.C.; and Captain W. L. Jordan, D.S.C., D.F.C.

allotted handicap of 1 hr. 33 min. he would have had to get something well over 200 miles an hour out of the "Semi-Quaver." That is to say, as the "Baby" covered the whole course in 2 hr. 32 min. 6 sec., Mr. Courtney would have had to do it in less than an hour.

As it was he won the Aerial Derby handsomely and took third place in the Handicap. Added to which he has certainly put up a World's Record for 200 miles, and very probably for all distances from 100 km. upwards, though as he was only timed at 100 and 200 miles he cannot claim the other distances. Thus for the first time the traditional Martinsyde bad luck gave the firm a rest, and a Martinsyde machine scored as it deserved.

But even so, the bad luck could not depart without a final kick, for the beautiful little "Semi-Quaver" crashed herself very successfully in landing. Mr. Courtney turned above Old Hendon, glided and slipped her down very skilfully, and appeared to land at what is, for such a machine, a very low speed. But she struck a bad piece of ground, did two enormous bounds, fell over onto her left wing-tip, turned half a cartwheel from the wing-tip onto her nose, and fell over onto her back, where she lay with her wheels spinning plaintively.

As she went over, one of the pioneers of aviation who was watching the performance remarked casually—"Well! She's a good machine to tuck into." And, sure enough, within half a minute Mr. Courtney appeared from under the machine, seemingly uninjured, barring that he was nursing that part of his anatomy on which, apparently, his safety belt had acted rather violently as a brake. The usual St. John's Ambulance men rushed out with stretchers, full of zeal, but soon returned with the expressions of men who had been cheated of their just due, for Mr. Courtney had been abducted by a Hucks-Ford engine-starter. So far as one can gather his worst injury is a barked shin. And after it was ascertained that he was safe and sound, another bystander remarked, "Now, if he had had a Handley Page wing he could have flown just as fast and could have landed at twenty-five," which is quite possibly true.

Mr. Courtney, who, like so many fine pilots, is an Irishman, and from the County Cork at that, deserves all possible congratulations on his win. He flew a very plucky race, and kept a good course. But for the luck of the ground he would have made an excellent landing. Also, everybody will be delighted to see that those long-enduring partners, Messrs. Martin and Handasyde, have pulled off a big event at last. May it be only the first of a long series of successes. One's only regret is that their win was not achieved with a British engine.

The Also Rans.

The fourth man to finish, and the second in the Aerial Derby, was Mr. James, who passed the post at 17.14.27, while Mr. Courtney was almost in the act of doing his somersault. He had picked up quite a lot of time on all the men in front of him, and, but for the error which made him do two laps of the course, and the mistake over his engine at the start, would have beaten Mr. Courtney for third place in the Handicap.

Fifth in the Handicap came Capt. Jordan, at 17.15.47. His over-all time of 1 hr. 47 min. 47 sec. placed him sixth in the Aerial Derby. He had got away from Flight Lieut. Longton at Barnet, where the latter had come down owing to shortage of petrol. The assumption is that Flight Lieut. Longton's engine, having been in the machine for months in the Disposal Company's stores, was not running at her best, and so had to be driven at full throttle all the way. Capt. Jordan's engine had given trouble some days before and had been replaced by a new engine, which was, presumably, running more efficiently, besides having a bigger airscrew.

Mr. Nisbet, on the F.6 Martinsyde, finished at 17.17.43, thus taking sixth place in the Handicap and fourth in the Aerial Derby.

The third man in the Aerial Derby, though seventh in the Handicap, was Mr. Uwins on the Bristol. He finished at 17.21.20, and his over-all time was 1 hr. 32 min. 50 sec., just 23 sec. faster than Mr. Nisbet, to whom he was set to give four minutes. He made the most perfect landing of all the competitors, dropping his tail-skid and his wheels onto the ground at the same moment in a perfect "three-point landing" as poor Gustav Hamel used to call it.

The last finisher was Squadron Leader Hubbard, who came in at 17.29.10. His over-all time was 1 hr. 43 min. 40 sec., against Mr. Nisbet's 1 hr. 33 min. 13 sec., so there was evidently something wrong with his machine, which is of a type known to be much faster than Mr. Nisbet's. And so ended the racing.

The Handicapping.

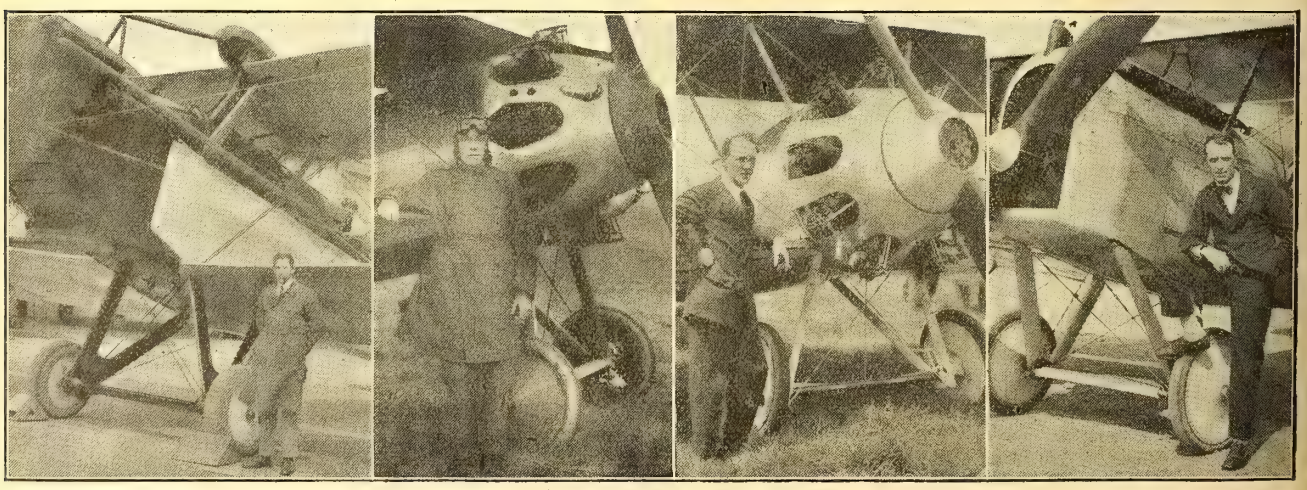
Despite the run-away win of the two Avros, one cannot call the handicapping bad, for the third, fourth, fifth and sixth men and Mr. Hawker finished inside 4½ min., though they were spread over 27 min. at the start. All the same, the handicappers ought to have known that the Avro "Baby" with a 35 h.p. Green does more than 65 miles an hour. That is just the worst of these highly technical people, they never will read THE AEROPLANE with sufficient care. If they did they would learn from it much more of practical value than they do from their comic text-books and scientific reports.

However, they gave easy victories to two very deserving young pilots and to two very interesting little machines and engines. Also they provided quite a good afternoon's sport, so one must not be too hard on them. It was, in fact, the first effort of this kind by the people who did the handicapping, so really they deserve to be congratulated on their results.

A Change of Aspect.

Outside the prize-winners, most sincere congratulations are due to the Committee of Management, composed of Mr. G. B. Cockburn; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Air Commodore E. M. Maitland, C.M.G., D.S.O.; and Group Capt. C. R. Samson, C.M.G., D.S.O.; together with Mr. Bernard Isaac and Mr. Harold Perrin, the organising secretaries. Between them they not only laid down a very nearly perfect scheme of organisation, but they set up a social standard entirely different from anything to which Hendon has been accustomed. First of all they had, as Judge of the racing, Brig.-General Sir Capel Holden, K.C.B., F.R.S.—Chairman of the R.Ae.C. Committee, and for years one of the most highly respected of those who have had to do with mechanical sport. Then they secured, as Stewards of the Meeting, Air Vice-Marshal Sir John Salmond, K.C.B., C.M.G., C.V.O., D.S.O.; Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.; and Lieut.-Col. John Dunville. And Lady Sykes, who was accompanied by Sir Frederick Sykes, presented the prizes with grace and charm.

Everything was done, as it should be, to make the meeting one at which officers and gentlemen could compete without loss of prestige, and at which people of the better sort could be seen without the danger of being included in snapshots or



THE NON-FINISHERS:—Left to right—Mr. F. S. Cotton (D.H.14a); Mr. L. R. Tait-Cox (Nieuport); Mr. H. G. Hawker (Sopwith); and Capt. D. G. Westgarth-Heslam (Avro).

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kinematograph pictures along with newspaper notorieties, doubtful members of the peerage, not in the least doubtful members of the peerage, shop-soiled aristocrats, bedimmed stars of the stage, and chronic limelighters. The first attempt was an absolute success, and it is earnestly to be hoped that it is only a prelude of much more to come.

One is perfectly convinced that well-run flying races will attract the public and so will convert thousands of people to a belief in aviation. Also, to see a competitor take a toss, as Mr. Courtney did, without being hurt, is an object-lesson in the safety of flying. Many a man is killed when steeple-chasing or hunting through a far less severe somersault, because when a horse rolls over the rider cannot tuck away inside him, but is very liable to be rolled upon instead.

Some Suggested Improvements.

There were one or two matters which might be improved at the next meeting. For example, parachute-jumping should be barred. One has the strongest belief in parachutes as life-saving implements in case of fire or the breakage of controls in civil aerial transport vehicles, and one regards them as essential in war machines. But one is certain that as a public exhibition parachuting is not the right thing at a serious aerial race-meeting. It partakes of the nature of a circus stunt, and if it actually attracts anybody at all it only attracts the wrong people.

There is no fun to be got out of watching a parachute jump unless one has all the time the underlying hope that, to use the Cockney idiom, "the blighter will break his blinkin' neck." If one were absolutely certain that the parachute would open every time and that nothing whatever would fail, the performance would be about as spectacular as watching a man walk down a flight of stairs.

Another point for the next meeting is the handling of the crowd. There was an ugly rush across the aerodrome from two of the enclosures after Mr. Courtney's crash. Fortunately it was stopped in time to prevent the mob from carrying the machine piecemeal away as souvenirs, but it was stopped with difficulty. Either more police are needed along the railings, or else some extra "air marshals" ought to be appointed—selected for their power of lung and acidity of tongue—whose job it would be to watch for such a rush and check it in time.

Otherwise some pilot arriving when the aerodrome is full of people may kill himself or wreck his machine in trying to avoid the fools. And though it would not really matter if he killed a few of them instead, it would not look well in the newspaper reports, and at present one has to be careful about the reputation of flying as a sport.

The Ariel Booky.

Lastly, there is the matter of bookmakers. If people want to bet on air races, by all means let them. Personally one never bets on anything, except one's own opinions. If others like to do so, good luck to them. But let us make sure that they get their money when they win. There were many bookies at Hendon on Saturday, laying entirely fantastic odds against the competitors in what their placards announced as "The Ariel Derby." Possibly it was some connection with that humorous sprite which accounted for their sudden disappearance.

The compatriots of Mr. Lloyd George may not have "set a girdle round the earth in forty minutes," but they certainly set a pretty hot pace out of the aerodrome while the crowd was looking the other way. And they spirited the money of a good many people away with them, including that of a prominent performer in the race, who had backed himself heavily.

In future it would be well to throw out any booky who cannot produce evidence of his trustworthiness. And then set a guard over the rest.

Incidentally, if the newspapers could be induced to publish the real betting prices of future races, and not such utter rot as the evening newspapers printed last Friday, it would help to popularise aviation quite a good deal. People always believe in a thing if they can bet on it.

A Word on the Engines.

So much for complaints. There are, however, some more matters for congratulation. Though the Aerial Derby itself was won by a foreign engine, it is eminently satisfactory to find so many British engines which are still more or less experimental doing well, besides the old and tried friends.

The little Greens were wonderful. Mr. Hinkler drove his ten-year-old specimen "all out" for nearly three hours and she never turned a hair. Capt. Hamersley did the same, which proves that the new are as good as the old. Therefore Mr. Freddy May has good right to congratulations.

The A.B.C. Engine Co. also deserve to be congratulated on the performances of the two "Dragonflies" driven by Mr. Hawker and Mr. James. It was not the fault of the engines if both pilots "took the wrong turning" and so failed to win places which they should have won. The fact remains that both engines ran magnificently from start to finish.

Mr. Roy Fedden is to be congratulated on the first appearance of the Bristol "Jupiter." Probably Mr. Uwins was not running it on full throttle all the way. It would have been unwise to do so. But it stayed the course and made very fast time, so evidently it is going to be very good indeed when it is fully developed.

It was a pity that there was no Napier in a fast machine. One would like to see a special Martinsyde built round one of the 450 h.p. Napiers. It should show distinctly perceptible movement. Also it was a pity there were no Rolls-Royces in the race. The "Falcon" ought to have made a good show against the Hispano-Suiza.

The Men Who Did the Work.

Though the Nieuports did not win anything (except 2nd in the Aerial Derby for which there is no prize), the Nieuport people can pride themselves on the *esprit de corps* of their employees. All the men working on their machines wore the famous Nieuport colours, blue and yellow, as neck-ties and as rosettes. Also the smallest boy in the Nieuport works was dressed up in the firm's colours, equipped with flying cap and safety belt, and paraded everywhere with the machines. It is true that he did not bring them much luck, but this was his first shot as a mascot so he may do better next time.

The Martinsyde crew were, of course, the essence of keenness. They always are. And for once they have had their deserts. May their luck continue.

The young R.A.F. airmen who were looking after Squadron Leader Fall and Flight. Lieut. Longton were splendid. It is good both for the Service and for the Industry that the new R.A.F. should mix with the very best of the civilian aeroplane mechanics as happens on such occasions as this. The interchange of technical experiences is good for both. The extra-

PLACINGS AND TIMES IN THE AERIAL DERBY AND IN THE OPEN HANDICAP.—July 24th 1920.—205 Miles.

No.	Pilot.	Machine and Engine.	Handicap	Starting Time.	Finished First Circuit.	Finished Race.	Time of First Circuit. h. m sec	Time of Second Circuit. h. m. sec	Total Flying Time. h. m. sec	Speed M.P.H.	Position in Aerial Derby.	Position in the Handicap.
16	F. R. Tait-Cox	Nieuport "L.S.3." 320 H.P. A.B.C.	Scratch	15.56.00	Retired.	—	Landed at Brooklands in First Circuit.					
15	F. D. Courtney ...	Martinsyde "Semi-Quaver." 300 H.P. Hispano-Suiza	1 min.	15.55.00	16.34.25	17.13.12	0 39 25	0 38 47	1 18 12	153.45	1	3
14	C. F. Uwins	Bristol "Bullet" 450 H.P. Bristol "Jupiter."	7½ mins.	15.48.30	16 37.16	17 21.20	0 48 46	0 44 4	1 32 50	129.26	3	7
13	H. G. Hawker	Sopwith "Rainbow." 320 H.P. A.B.C.	9 mins.	15.47.00	16.28.31	17.11.00 (Approx.)	0 41 31	Third man home but landed without crossing finishing line.				
12	T. O'B. Hubbard ...	Martinsyde "F.4." 360 H.P Hispano-Suiza	10½ m ns	15.45.30	16 40.50	17.29.10	0 55 20	0 48 19	1 43 40	115.75	5	8
11	R H. Nisbet	Martinsyde "F.6." 300 H.P. Hispano-Suiza	11½ mins.	15 44.30	16.31.00	17.17.43	0 46 30	0 46 43	1 31 13	128.75	4	6
10	J. H. James	Nieuport "Nighthawk" 320 H P. A.B.C.	12 mins.	15.44.00	15.28 21	17.14.27	0 44 21	0 46 6	1 30 27	132.67	2	4
8	D. G. W. Hasla n ...	Avro "Schneider." 230 H.P. Siddeley "Puma"	19½ mins.	15.36.30	Ret red.	—	Landed at Epping in First Circuit, owing to loss of petrol.					
7	J. S. T. Fall	Sopwith "Snipe." 200 H.P. "B.R.2."	28 mins.	15.28 00	Retired.	—	Landed at Hertford in First Circuit owing to Magneto Trouble.					
6	W. H. Longton ...	Sopwith "Snipe" 200 H.P. "B.R.2"	28 mins.	15 28.00	16.13.50	Retired.	0 53 50	Landed at Barnet in Second Circuit owing to shortage of Petrol.				
5	W. L. Jordon	Sopwith "Snipe." 200 .P. "B R 5."	28 mins.	15.28.00	16.13.53	17.15.47	0 53 53	0 53 54	1 47 47	111.33	6	5
4	F. S. Cotton	D H "14a." 450 H.P. Napier	40½ mins	15.15 30	16.10.43	Retired.	0 55 13	Landed at Hertford in Second Circuit.				
3	Leth Jensen	Spad "S.29." 80 H.P. Le Rhone	45 mins	Non-Starter.	—	—	Did not arrive at the Starting Point.					
2	H. A. Hamersley ...	Avro "Baby." 35 H.P. Green	1h. 34 m	14 22.0	15.38 00	16.54 06	1 16 0	1 16 6	2 32 6	78 89	7	1
1	Bert Hinkler	Avro "Baby." 35 H.P. Green	1h. 41 m.	14.15.00	15.38.33	17.00.46	1 23 33	1 22 12	2 45 46	72.39	8	2

[NOTE—Mr. Hawker's speed for one lap was 144.52 m.p.h., and Mr. Cotton's 108.63 m.p.h.]

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AERIAL DERBY RESULT

1st. MARTINSYDE SEMI-QUAVER. Average speed 153.45 m.p.h. 12 mins. 15 secs. ahead of nearest competitor.

4th. MARTINSYDE F.6

5th. MARTIN-SYDE F.4.

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Aerial Derby Handicap.

3rd. MARTINSYDE SEMIQUAVER.

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ordinary neatness and smartness of the R.A.F. men set a good example to the civilian aeroplane hand, who is inclined to be untidy, and the consciousness of his own smartness tends to make the R.A.F. man all the smarter. They are very good lads indeed, these new airmen of the R.A.F.

The Avro crew were nearly all old friends of the Brooklands days. It took one back seven or eight years to see them again. Also one came across similar pioneers of aviation among the Sopwith and Bristol crews In fact, one does not know which was the more pleasant, the meeting with old friends in the aeroplane park among the machines behind the starting line or in the paddock among the lordly automobiles. There must be something in aviation or so many clever mechanics and engineers would not stick to it. One hopes in years to come to see them all profiting, or even profiteering, by their faith in flying.

Meantime one hopes that the Royal Aero Club has paid its way over the Aerial Derby Meeting sufficiently well to justify the Committee in arranging another meeting in September or early October, when the weather is good and the holiday-makers are back in Town. The almost brilliant success of this meeting should assure even greater success for the next.

C. G. G.

[Mr. Cotton's crash occurred at Hertford at 16.46 hours. When he turned to land at 16.45 hours, he was only six minutes from the finishing point, and Mr. Hinkler was in sight just ahead. The first circuit was completed in 54½ min., which shows the speed of this big machine.

The cause of the stoppage was the severing of the petrol pipe. The carburetter then caught fire, so Mr. Cotton dived the machine and extinguished the flames. She then started to spin, but the pilot got her out of this and landed her in an oatfield through some trees. The wings actually went through the foliage of these trees and there was about 4 ft. clearance between the wing-tips and the tree trunks.

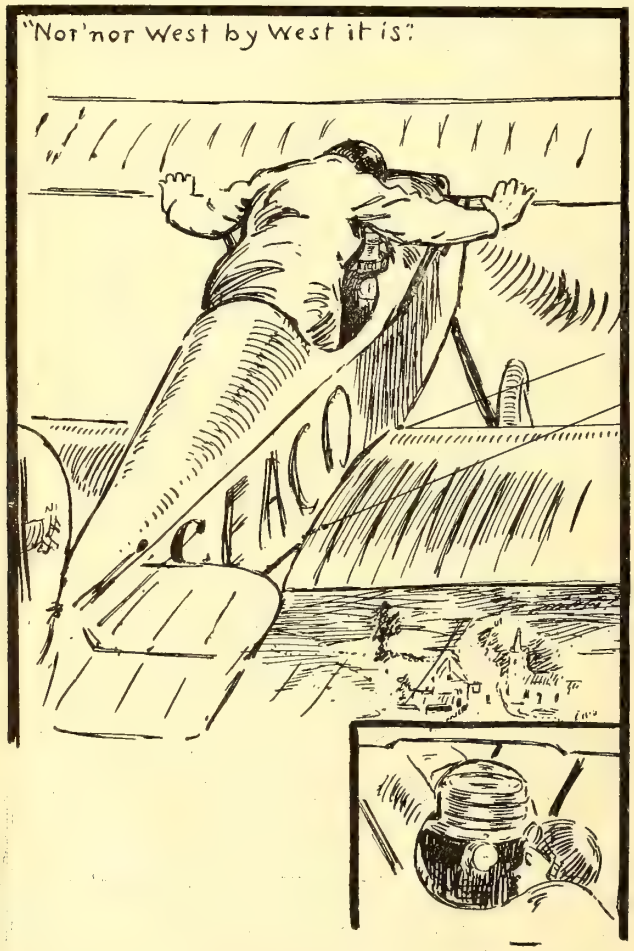
As she was passing into the field her tail skid hit a hedge which was planted on the top of a small bank. Even then she would have been all right, had not the undercarriage struck another mound. This unfortunately caused the machine to turn a somersault and she finished on her back. Mr. Cotton was unhurt, but his passenger was slightly injured.—G. D.]

IMPRESSIONS OF THE AERIAL DERBY.

By the Usual Irresponsible Contributor.

The British Aviation Championship, which is now generally considered to be held by the winner of the Aerial Derby, was won on Saturday by Mr. Frank Courtney on the Martinsyde "Semiquaver" with 300-h.p. Hispano-Suiza. The previous holder Capt. Gathergood did not defend his title, both he and his firm having withdrawn from active aviation. Mr. Courtney's win was particularly brilliant, for he had only been appointed to the machine the previous day, Mr. Raynham, the regular pilot, having been hurt slightly in his argument with a grass mower.

Everyone will sympathise with Mr. Tait-Cox in his bad luck in being again let down by his engine. It will be remembered that in last year's race he was a close second when his engine cut out half-way round the second circuit This year he has been working on "Goshawk" for weeks past and lately he has had the engine running to his satisfaction. Before the race he told one that the engine was just right. He made a good start and in spite of the fact that his engine then was not doing its best, was overhauling "Semiquaver," but over Hounslow the engine cut right out, and when it picked up it had lost some 300 revs., so he very wisely decided not to risk damaging the machine by a chance landing in a small field He, therefore, pulled out of the race and landed at Brooklands. The news of his landing caused intense disappointment at Hendon. One takes this opportunity of wishing him success in the Gordon-Bennett race for the World's Championship.



Mr Hinkler and his compass

A new dignity for Aviation.

Consulting the Map.

At 14.15 Mr. Hinkler started off on a compass with a small Baby Avro attachment to prevent the compass making a beeline for the North Pole, and Capt. Hamersley followed. Some 40 minutes then elapsed and Mr. Cotton started on his big Napier-engined machine. It towered above all the other machines on the ground and rather reminded one of a blackbird teaching its young to fly.

The three "Snipes" then made a good formation start. Great excitement in Lincolnshire. The Sopwith Aviation and Engineering Company, Ltd. (hereinafter called the S.A. and E.C.L.) decided to keep on building aeroplanes at a rate of 16,237 per war.

Apropos the S.A. and E.C.L., for pilots who were fond of "Camels," a most realistic imitation of their early efforts on this machine was discovered on the way to the Derby. All one has to do is to rush in a great hurry down Dover Street Tube staircase. One starts in a right-hand spin and, just when one thinks one is out of this, one finds oneself spinning to the left.

The Avro Schneider Puma then got away at a great pace. Shortly after this Capt. Hamersley's "Baby" was seen coming in the distance followed by Mr. Hinkler's Compass. As these two machines flew almost noiselessly round the course, they reminded one of nothing so much as a pair of owls (the machines, not the pilots). Mr. James lost a little time in starting owing to the same trouble as many motor cyclists encounter when starting up their bicycles. Nevertheless, he wasted little time once he got going, and his general flying was as good as anything of the day. It was not his fault

(*Continued on page* 265.)

AERIAL DERBY

HANDICAP

1st Prize

(Capt. H. A. Hamersley, M.C.)

2nd Prize

(Mr. Bert Hinkler)

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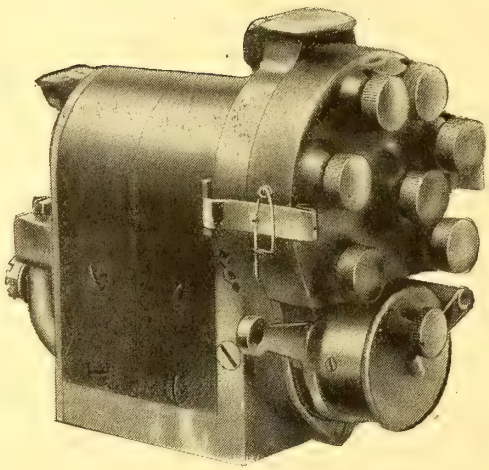

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THE WEEKLY COMMENTARY.

In a carefully considered article, Captain W. H. Sayers discusses some of the lessons of the recent Aero Show, coloured by his personal opinions. Also he explodes one or two popular illusions concerning the relative merits and demerits of wood and steel construction.

Mr. Leonard Bridgman contributes some more of his educative sketches of aeroplane details as seen at the Show. The contrasts between various designers' arrangements of cockpits and tailplanes is distinctly interesting, and at least equally so is the difference between three able designers' methods of housing "six-cylinder-in-line" engines.

That extremely logical and quaint writer, "Medway," discusses some ways in which future Shows may be made more successful, and reminds his readers that certain valuable suggestions made by him a year or more ago are still worth considering. One hopes that the high and mighty who have so far mismanaged all our Aero Shows will condescend to consider his suggestions.

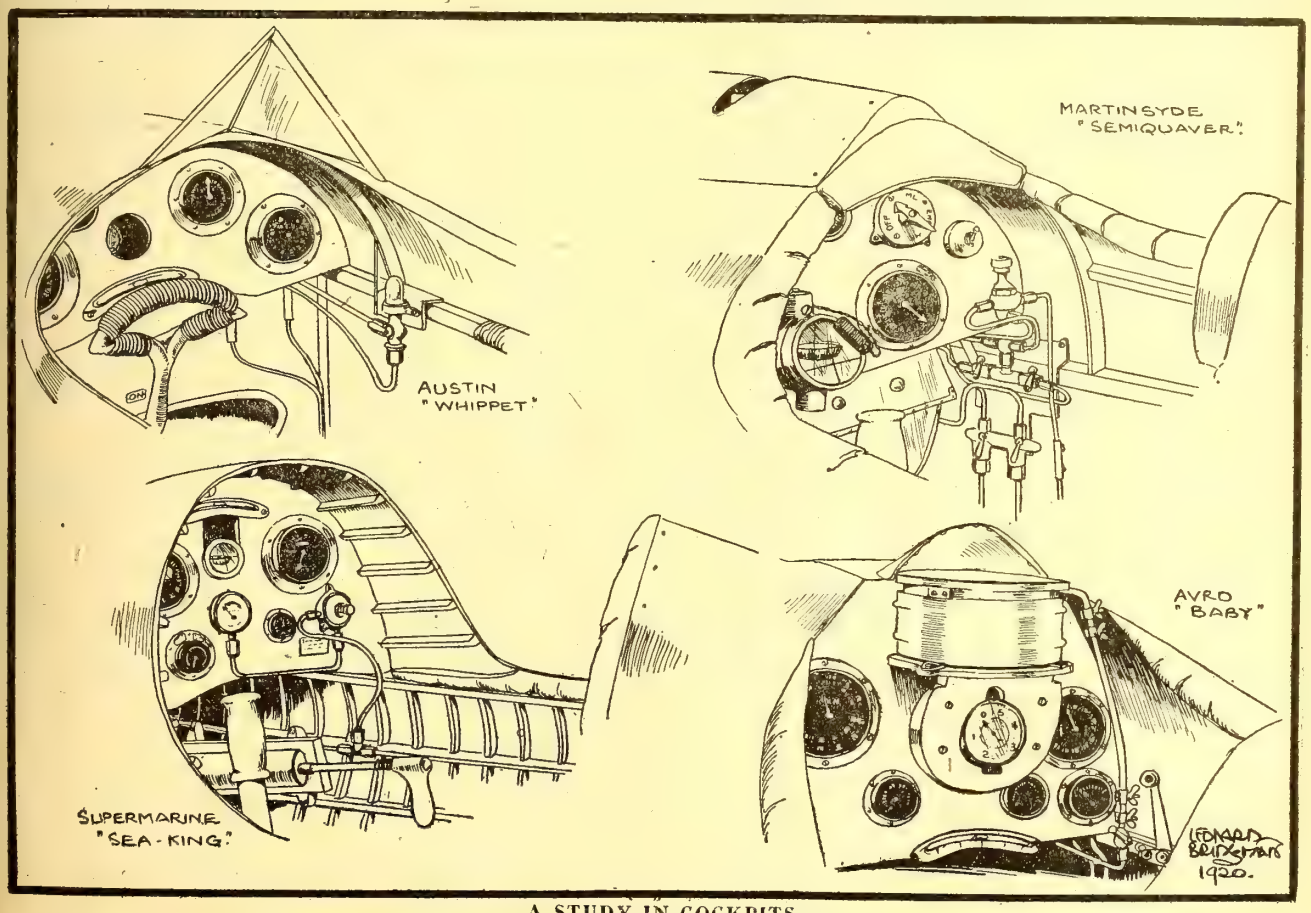
A list of the foreign notabilities who visited Olympia, issued officially, indicates that the exhibition may have done good, even though the said list would seem to include almost the whole "gate" for the ten days of the Show.

LESSONS OF THE AERO SHOW, 1920.

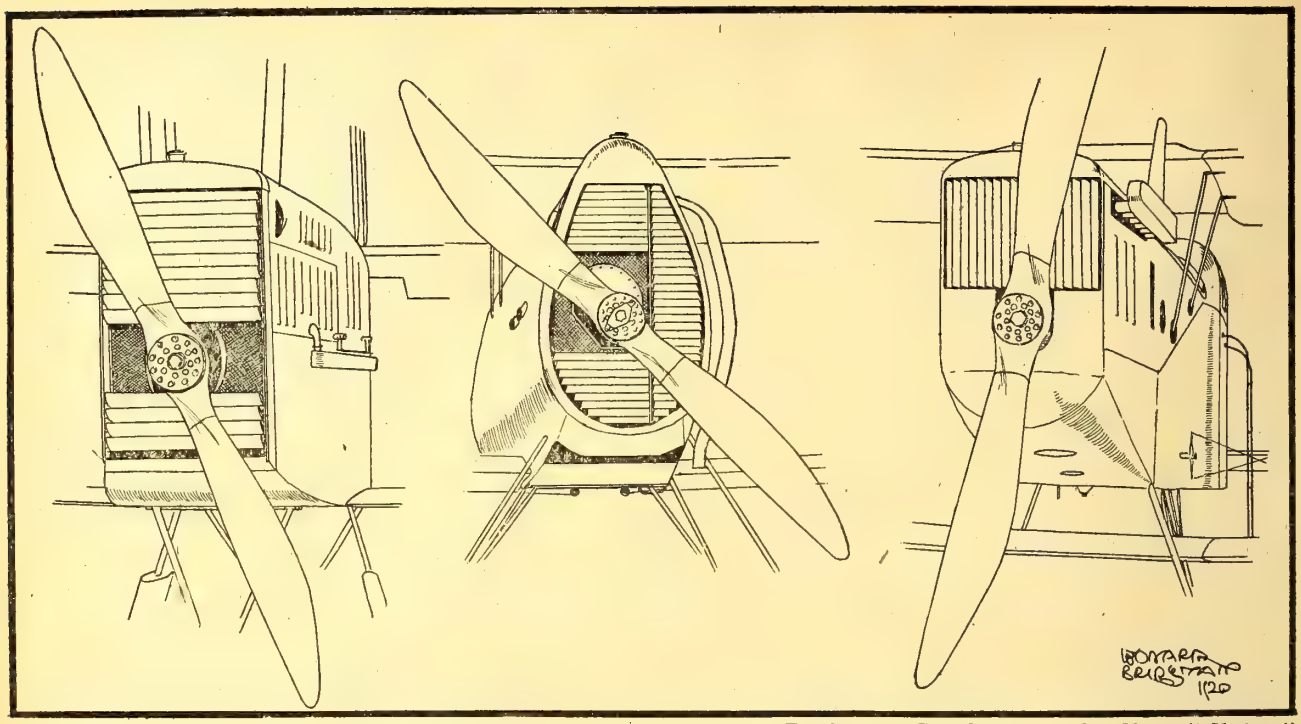
By W. H. Sayers.

To one who would draw morals as to the prevailing tendencies of aeroplane construction the recent Aero Show at Olympia gives but little guidance. There were no extraordinary machines, no startling changes of form, arrangement or design whereon to base deductions or to prophesy as to the future.

The very marked predominance of the tractor biplane would seem to carry a message—but even here the voice is a little weak and uncertain. The test of war certainly seemed to show that the type has advantages of performance over all others so far tested—but had the synchronised gun failed to reach a satisfactory stage of develop-



A STUDY IN COCKPITS.



A STUDY IN NOSES.—Left to Right, a Siddeley "Puma" in the Avro Triplane; a Beardmore in the Short "Shrimp"; and a "Puma" in the Bristol "Coupé."

ment during the War would tractor biplanes have predominated in 1920?

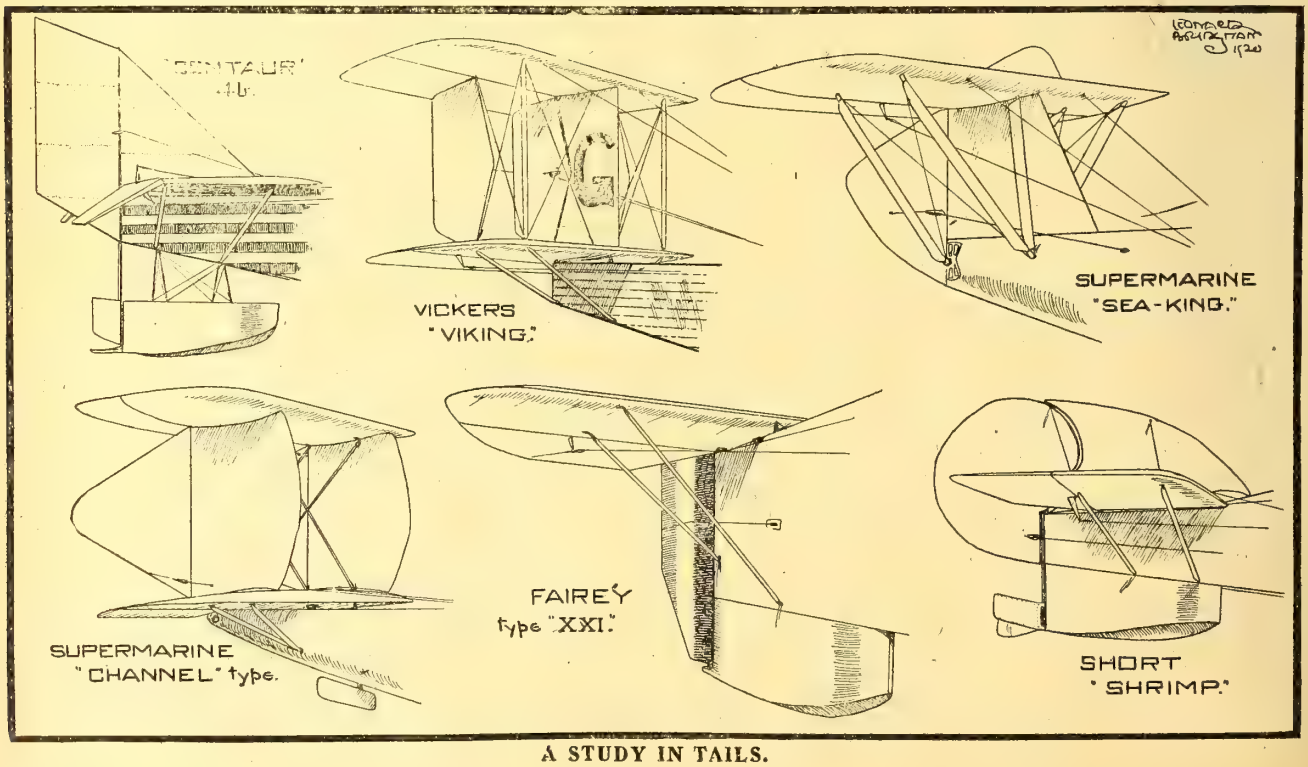
It is doubtful—and peace may yet show that the pusher type has its value for commercial purposes. It is certain that for pleasure flying in fine weather the limousine type of aeroplane is far from ideal—the open tractor type is nearly impossible—one can neither see from it nor hear in it, and that the pusher type with a decently silenced engine has many advantages for such work. And if flying is to remain unpleasant it will certainly remain unpopular.

As with aeroplanes, so with engines—and even more so. There is not even an apparent predominance of any one type.

One all-metal aeroplane provides the nearest approach to a really startling innovation. From this, however, there can be but few deductions to be drawn. One "Swallow" is but little towards the Summer of metal construction. There are, it is true, other examples showing that experimental work on metal aeroplanes has progressed greatly since 1914, and that there is now no insuperable difficulty to the manufacture of complete aircraft out of either steel or the light aluminium alloys.

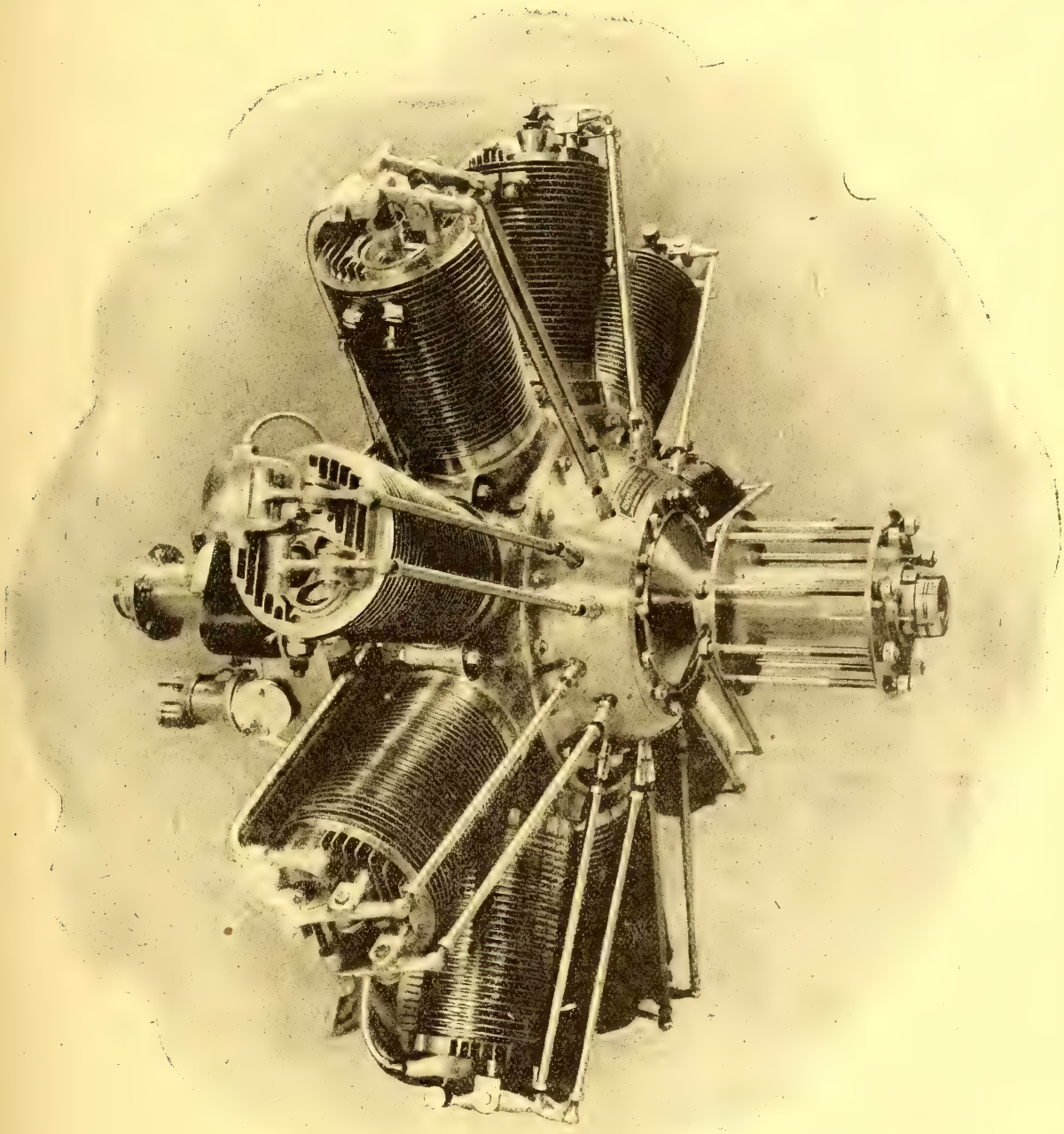
It is true that metal has many advantages as a structural material as against timber. It does not swell and contract and change its shape with alterations in temperatures and humidity as does wood.

But it does rust or corrode unless very special precautions are taken against such happenings. And, of the two evils, probably many will prefer the warping of wood.



A STUDY IN TAILS.

GWYNNE'S AERO ENGINES



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Metal is fireproof—wood is not—but this point is of but small practical importance. When fireproof petrol can be used in aero engines then wooden machines will be as safe against fire as is a wooden cart. Till then the metal aeroplane is in grave danger of fire.

There is little or nothing to choose in the matter of strength or weight between the wooden and the metal structure, if both be skilfully designed. Metal calls probably for a greater degree of skill and a greater knowledge of materials on the part of the designer than does wood, but even the most skilled of designers can be hired very cheaply.

Wood is an excellent, cheap and easily obtained structural material. It calls for few and simple appliances to work it to shape, it needs little in the way of testing appliances to determine its qualities—and a good piece of wood is and remains recognisably a good piece of wood.

Any metal physically capable of competing with wood for aircraft work is necessarily a comparatively expensive material. It is often undistinguishable in appearance from another similar metal of markedly different physical qualities. These qualities are by no means permanent, any fool with a blow lamp can alter them through a very wide range without leaving any visible evidence of the change.

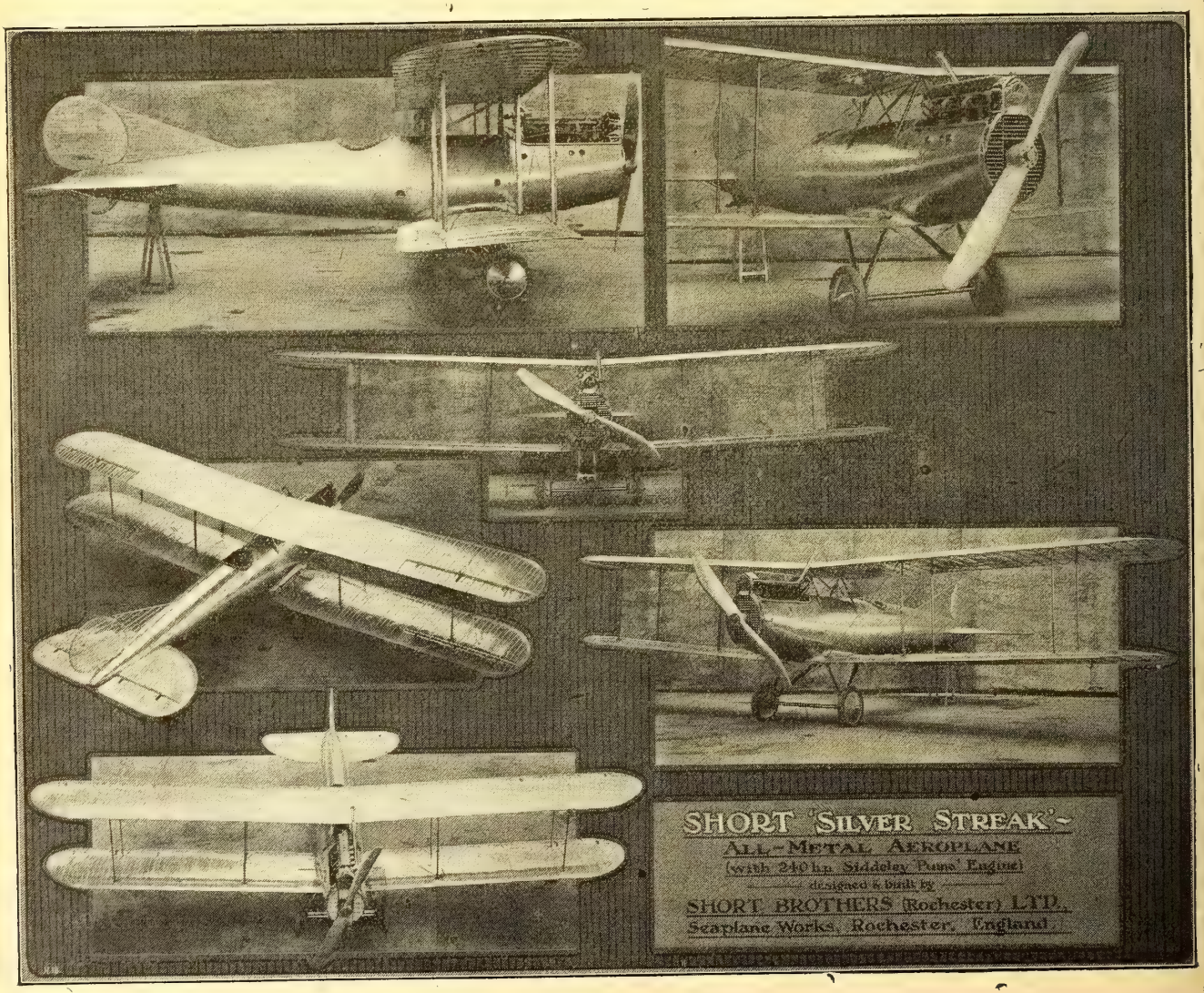
Metal can be worked to shape more rapidly and more accurately than can wood, and with less labour, but on the other hand its working usually calls for extensive plant. The exact conditions under which it is worked, and the nature of the treatment it receives before, during and after working, often need very careful control in order that its strength may not be impaired in the process.

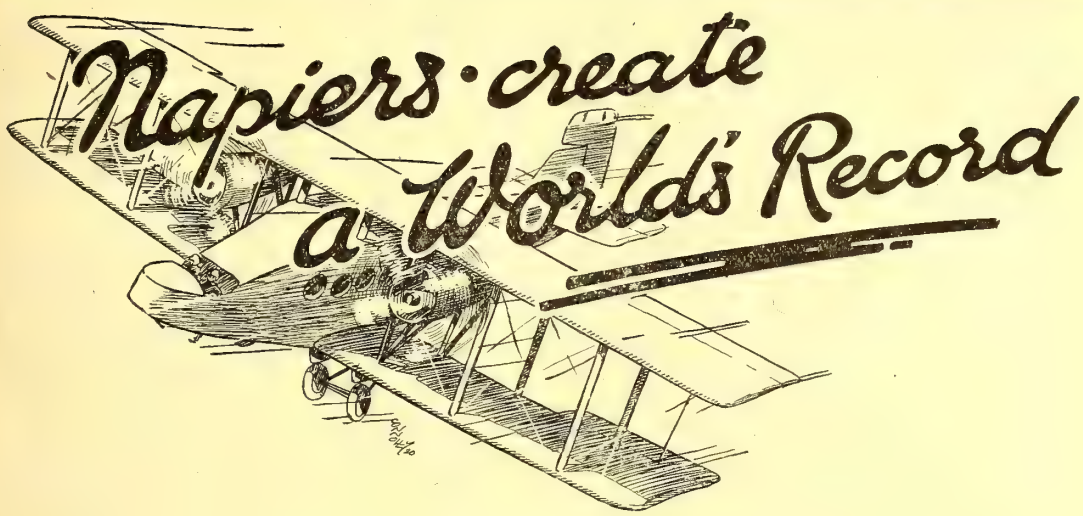
Which means that metal aircraft production entails expensive plant and tools, and thorough and careful control and inspection during manufacture, and consequently an expensive control and inspection organisation.

Given a really large output of similar aeroplanes the rapidity with which metal components can be manufactured would reduce the importance of these costs to such an extent that the metal machine would prove cheaper than the wooden one. Had war continued, doubtless metal machines would even now be cheaper to build than are timber-framed ones, but with the existing demand for aeroplanes there is no question that the metal aeroplane costs more than it is worth as compared with the existing type.

When aeroplanes are produced in such quantities as are motor cars, then metal machines will be justified on the cost basis alone. At present their advantages by no means justify the cost of building them.

As there seems to be little that may be regarded as of revolutionary import in the general design of machines, it were well to consider the details of existing machines. Here there is to be found a very marked advance. In the last Aero Show there were to be seen many machines of most excellent general design—even judged by modern standards—which in details would have disgraced the average travelling tinker. To-day there is practically no fitting discoverable on any machine that one could confidently assert to be unsafe, and very few that did not bear signs that careful thought and adequate knowledge had gone to their design. For this state of affairs one has





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Court Journal, 28/6/20.

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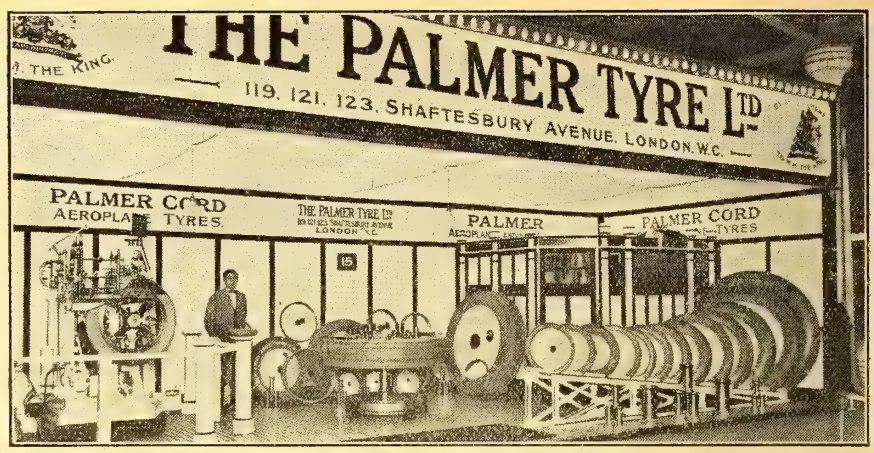


ONE OF THE MOST INTERESTING STANDS AT OLYMPIA.—The Palmer Tyre, Ltd., showed not only a very complete range of tyres and wheels, but one of the famous "cord-laying" machines which made it possible to produce so elaborate a piece of work not only accurately but at a reasonable price. This machine is seen on the left of the picture. The biggest sized tyre is seen in the middle of the stand.

to thank the officials of the Air Ministry Technical Department and of the A.I.D.

Much adversity has in the past befallen the Aircraft Industry through these—it may even be questioned whether they really assisted at the winning of the war in the air—but through adversity the British aeroplane manufacturer has risen to a position well above that of his competitors of any other nation for the soundness and safety of his detailed design. "Per ardua ad astra" is a motto of no limited significance.

On this subject of detail design the exhibit of A.I.D. testing and checking methods which occupied nearly half the gallery throws a most interesting light. It leaves the impression that if—as is the case—any British aircraft possessing an airworthiness certificate must have passed A.I.D. inspection, then either defective material or faulty workmanship can hardly exist.

It is understood that, of the very few people who did visit Olympia, the really important ones—such as the official representatives of foreign Governments—were more impressed by this part of the exhibit than by any other. Their attitude seems to have been that they now realised why British aeroplanes cost more than did the products of other countries, and that they thought the extra cost thoroughly justified.

If the S.B.A.C. could have arranged that the general run of the public saw and properly appreciated this part of the exhibition they would have done something towards gaining public confidence in aerial transport.

Apart, however, from the uniform and high standard of detail design there was little of definitely marked tendencies to standardised practice. In timber, spruce holds the field—ash is still used for some fuselage longerons—but even here seems to be vanishing.

Solid spars are disappearing, and laminated or box spars, glued and taped, are now nearly universal. Wing ribs call for little comment—except that the wooden box compression rib has practically disappeared and proper struts now take the drag loads within the wing.

Interplane struts seem about evenly divided as between steel tube and spruce. Where steel tubes are used they are generally circular in section with wooden fairings, and streamline section tubes appear to be out of favour..

Streamline wire for exposed bracings is usual practice.

Metal fittings for wing spars and fuselage fittings are now invariably of steel—generally sheet metal stampings, though machined up forgings are largely used.

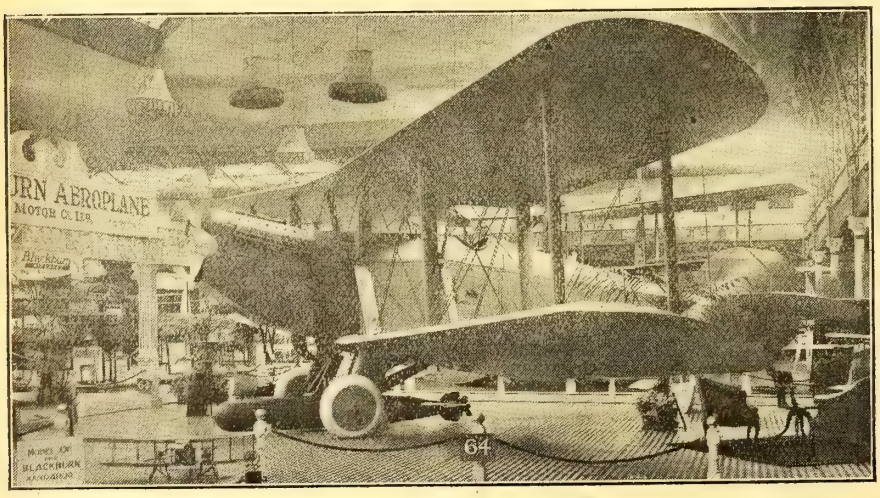
Complex welded up or brazed sheet steel fittings subject to heavy loads are growing rare—either the whole fitting is cunningly contrived out of the single piece, or attached portions held on by rivets or bolts.

Standardised fittings for such joints as those between fuselage longerons and their struts are now in evidence.

In such a case it is necessary to design the fuselage to take the standardised fitting, which in theory at least should call for some extra weight in the structure. In practice, if the standardised fitting is intelligently designed in the first place this extra weight becomes negligible. Since the practice originated in wartime with the continual demand for higher and still higher performances it may be expected to extend during the Peace.

To sum up, Olympia has disclosed no startling novelties—nothing which holds the promise of any immediate revolution in aerial transport. It did show, among the machines and engines, a general very high standard of workmanship and of design, and among the accessories a very considerable amount of thought and enterprise.

If the next Aero Show follows it in the general excellence of its exhibits, and if in addition it can succeed in attracting the general public and in impressing on them how far the aeroplane has gone towards becoming a safe and reliable vehicle, it will have justified its existence.



THE BLACKBURN "SWIFT."—The new torpedo-dropping seaplane produced by the Blackburn Co., of Leeds, together with one of the torpedoes which it carries on active service. The actual torpedo-dropping gear was not shown, but the peculiar way in which the exhaust pipes are led down under the fuselage set foreign Service people thinking of how they could be used in connection with "heater" torpedoes.

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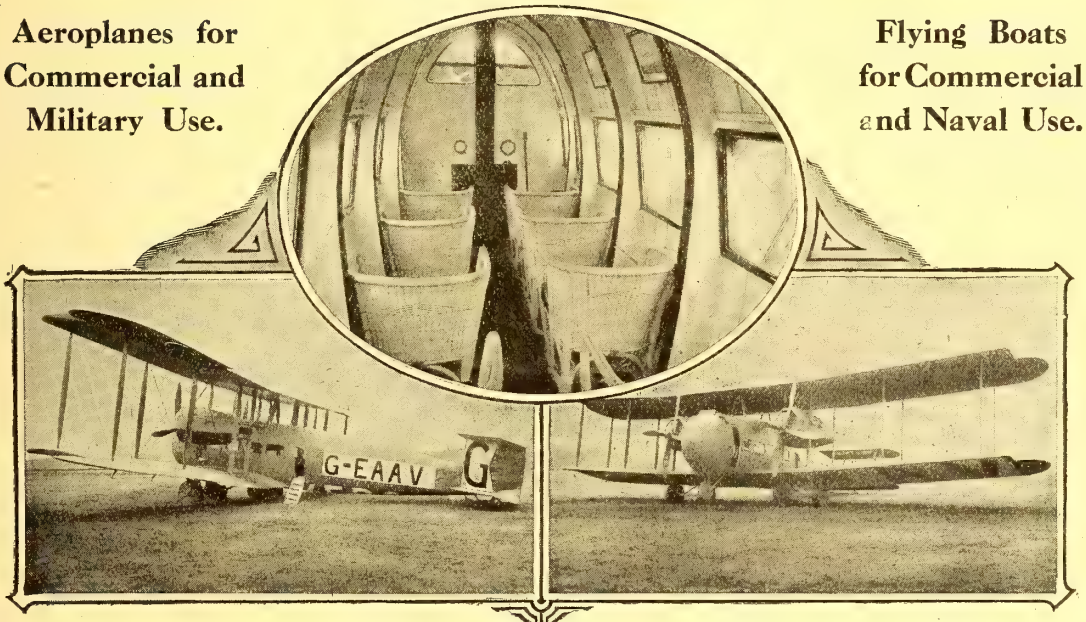

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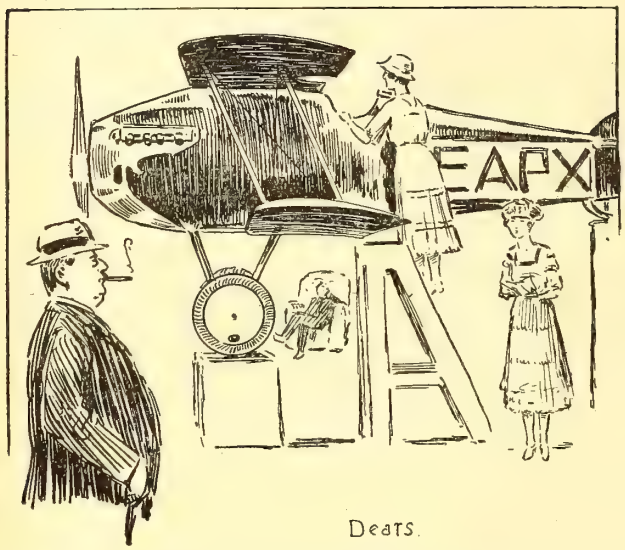
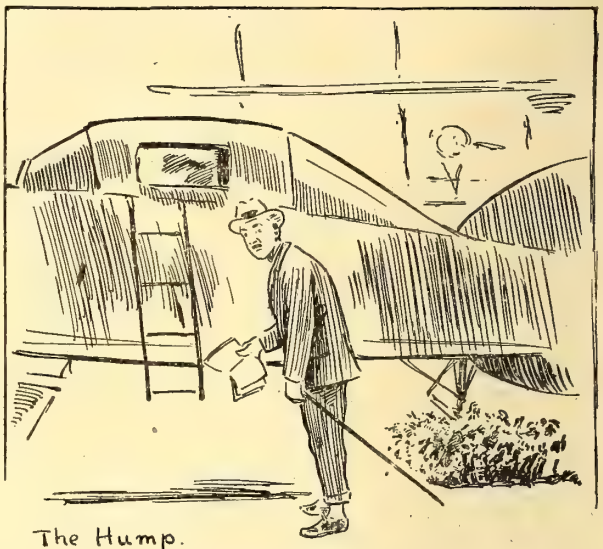
By "MEDWAY." With Entirely Irrelevant Illustrations by E. Sinclair Puckett.



Deats.



The Hump.
Portrait of a Gentleman discovering a Streamlined Coupé

From some points of view the Aero Show may have been —in fact, I am told it was—surprisingly successful. From others, without the slightest doubt, it was a howling failure. A friend of mine, who is not addicted to exaggerating, assures me that on one afternoon the crowd amounted to three and a dog, of whom, in his opinion, the dog was the most likely purchaser, being the only one of the four to say nothing revealing a complete ignorance and apathy with regard to the whole subject.

My own experience was not quite so bad as this, but I must confess that I should have expected, and should, I believe, have seen as large an audience if the Exhibition had been held, say, at Land's End or John o' Groats.

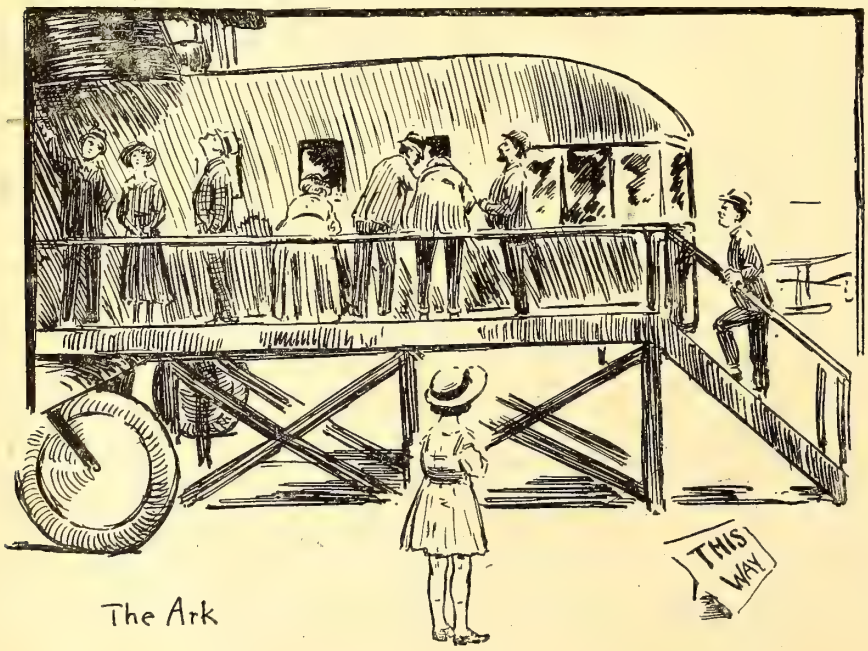
Now this is very extraordinary when we remember the immense interest that the public has taken in aircraft and the progress of flight ever since it was first demonstrated that an attempt to conquer the air is not necessarily tantamount to a playful form of suicide. Even now tens of thousands of people will go and watch a series of aerial stunts, but apparently not one in a hundred of these people care to get to close quarters with the actual machines and their engines. The question naturally arises whether the absence of interest in the show was due to inherent apathy on the part of the public, or to something lacking on the part of the organisers. I fancy it is a combination of both.

When people watch wonderful aerial performances they are attracted, perhaps unconsciously, by the idea that the exhibition involves danger. Given proper publicity, an enormous crowd could be got to watch a man bobbing down Niagara in a barrel, or any such foolhardy exhibition. The subsequent interest of the crowd in the barrel itself would depend mainly on whether the man was killed. If so, there would be lots of people who would want to keep bits as relics. If not, the sale price of timber would depreciate.

The next point is, perhaps, that the general public is for the moment a little bit sick of aeroplanes and is at any rate thoroughly familiar with their general appearance. It is a comparatively dull business to look at an aeroplane which is not indulging in a freak performance and from which there is not the slightest prospect of bombs being dropped upon one's head. People have in fact got a little *blasé*.

The next point, I cannot help thinking, is that not very much was done to work up the attendance at the show. If I am right, the promoters are not necessarily to blame. The Aircraft Industry has had a rough time for the last year or so. I can imagine that, when it was too late to withdraw, a good many people may have come to the conclusion that it was a pity they were involved in a show at all and the thing was foredoomed to failure.

When one is in part responsible for something that seems likely to fall far short of expectations and to reveal weakness where we meant to show strength, it is rather natural not to go to any special trouble to get people to witness the fiasco. Had one cut out of Olympia the whole of the Air Ministry's exhibit and that of the Aircraft Disposal Company—neither of them strictly manufacturing exhibits —we should, as they say on the tombstones, have left a gap which nobody else could fill. Both these exhibits were, in fact, tremendously interesting, but I doubt whether the manufacturers sufficiently realised in advance how great would be their interest. Assuming that there were a good many pessimists among the organising body, one can see why more steps were not taken to try and turn the show into a big social event and something more.



The Ark

I question whether the Aircraft Industry, despite what it has gone through in the last few months, has even yet quite got rid of its old idea that people who are merely concerned with movement along the surface of the ground are beneath contempt or, at any rate, a little lower than the angels that fly in the air, and, therefore, not to be much considered. It would be better on such an occasion to realise that if the people themselves are of little account, their money may be more useful. It would be just as well for the Aircraft In-

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dustry that the common herd, who still walk about on legs, should be got to pay for the industry's propaganda.

My next point is that there were not enough exhibitors to make it possible for the daily Press to devote as much space as it might have otherwise done to the Exhibition. The Air Ministry's exhibit was mostly above the average man's head. Neither does the average man, even though he be a journalist, appreciate the niceties of the various designs of aeroplane and aero engine.

Anybody can come to a motor car show and put up a decent pretence of being a practical motorist, because everybody has a nodding acquaintance with motor cars. It would be far more difficult to talk about aeroplanes in which one has never flown to a man who knows all about them.

Some Neglected Advice.

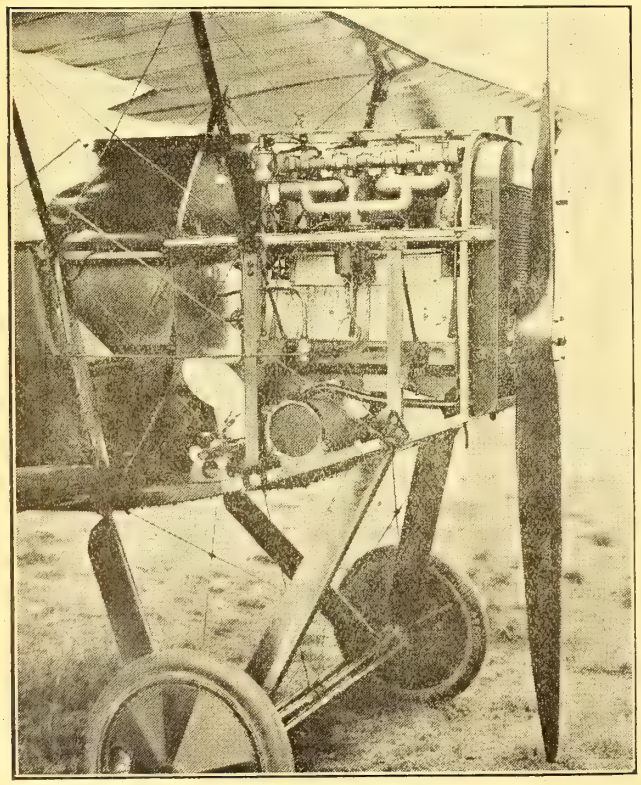
About a year ago, if not more, I made certain suggestions which in my humble opinion might help to make an aircraft exhibition successful. They were not adopted, and I am not prepared to blame anyone for neglecting my advice, because, as I have already remarked, the actual exhibits might have been insufficient to give a proper impression, and had that happened, the fewer people let into the secret the better. One of my ideas was that it would have been a good thing for the Aircraft Industry to adopt a principle already successfully tried by the commercial motor vehicle manufacturers

I still believe that had this suggestion been considered on its merits something could have been done with it. I have always deprecated the determination of some people connected with aircraft to treat the motor industry as though it and all its works were infectious. The principle to which I have just referred is that of organising a conference at the same time and place as the show.

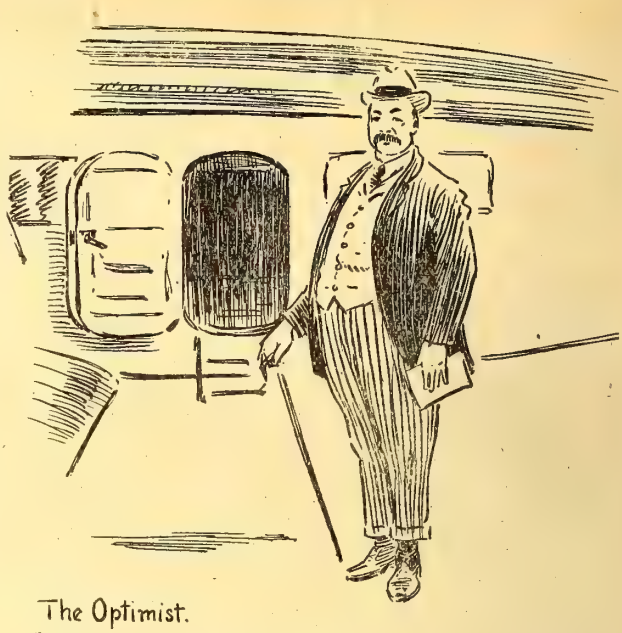
The scheme worked well with the Commercial Vehicle Exhibition in 1913; it worked well again at the Roads and Transport Exhibition last year. In the latter case it secured the presence of very large numbers of officials of local authorities at a show, the exhibitors of which were appealing to the local authorities in particular as buyers.

The Conference Scheme.

Supposing we were to organise a conference contemporary with an Aircraft Exhibition, it would not be very difficult to decide who ought to be asked to attend. We should start, of course, by getting together a Council or Committee of big names, and preferably of some intelligence, though the latter is a minor point if the names are big enough. Under the wing of this committee, which should have a strong proportion of officialdom in its composition without being official in itself, we should send out invitations to all the Governments of the world and through them to the Government departments concerned with civil or military aviation; to big organisations concerned with rapid transport, and to important



Details of the Engine Installation in the "Baby" Avro.



The Optimist.
"Perhaps some day aeroplanes will be built for outsize people."

bodies of pastoralists and others residing for the most part in districts where communications are lacking.

We should get, also, people responsible for running transport services on a big scale and we might also touch big industrial organisations to whom the applications of aerial photography might appeal. With an assurance of a repetition of the Ministry's exhibit we should also approach the scientists. Altogether it would be curious if we could not collect quite a large body of men from all parts of the world, representing important interests and potential buyers.

Some of these men would read papers, a few on scientific subjects, but the bulk dealing with practical developments not difficult to understand or to report. The Press would roll up, willing enough to deal with current aviation matters, but dry of copy so far as the actual show is concerned. The result would be plentiful publicity in all the live papers throughout the exhibition. The public would glance through lists of important names of people who had attended at the opening of the show and conference and had evidently been at the show on other days, and being sheep they would follow suit.

Some New Suggestions.

Having put forward this idea again, not in the spirit of "I told you so," but in case it might be some use in the future, I am inclined to go a peg further and suggest that an exhibition in the ordinary sense of the term is the wrong thing. Supposing, for instance, we were to have an exhibition of agricultural tractors in London, it would make a poor show in a large building and would attract nobody except a few stray Pressmen and free-ticket holders. Collect these same tractors in a few sheds half a dozen miles from a country town and demonstrate with them, or similar machines, in the fields, and you will get crowds that will allow every householder in the town to become a temporary profiteer.

The average man would like a motor car for his own amusement, but at present the average man has no great longing for a private aeroplane. The business is to come, if it comes at all, through people who will employ others to handle the machines for them. Therefore, they wish to see the machines at work as well as at rest.

If a machine of a certain make has just completed a fine performance in front of a big crowd, a fair percentage of that crowd will go straight off and examine a similar machine at rest if it is there to be seen. My conclusion is that the exhibition should be held at an aerodrome and should be coupled with attractive demonstrations and the necessary stunts to draw the multitude. If coupled also with a conference of the kind I have suggested, the element of solidity is introduced and the scientific and practical side emphasised.

It remains only to gather in the shekels by making the display a big social event of the season. This ought not to be particularly difficult. I suggest that it would be done by getting the backing of some society leaders who would allow to be announced in advance their intention of bringing parties to the display.

We should then have one very expensive day in order to make the company highly select, with the consequence that on that day we should probably get a bigger crowd than on any other. It would add a finishing touch if one or two Royalties could be induced to arrive by air.

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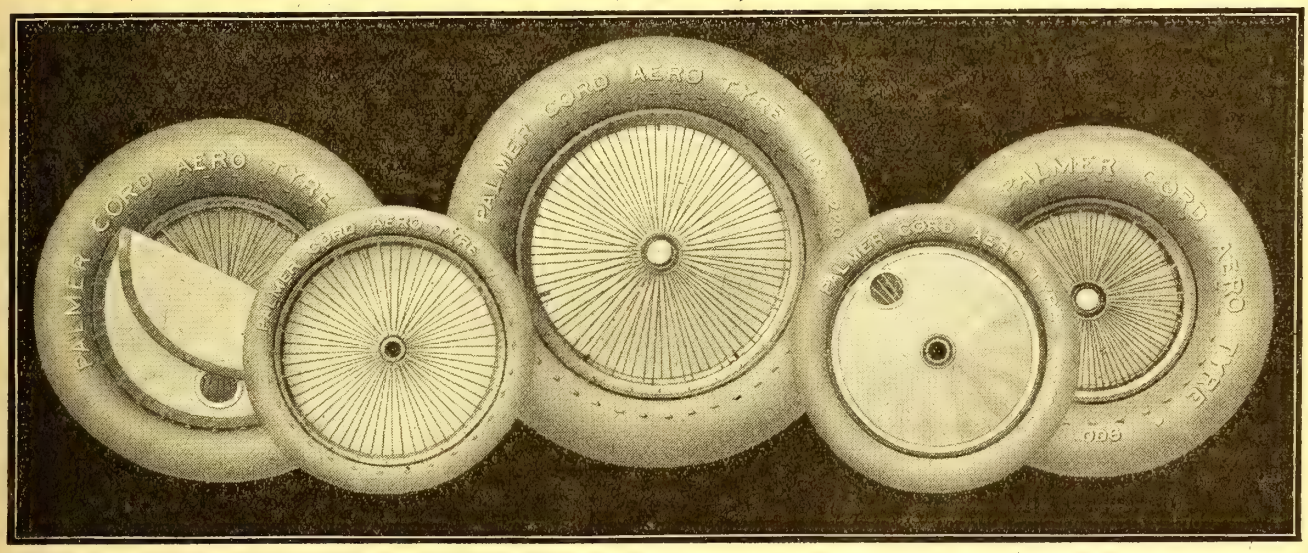

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Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
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300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132 46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135 50
,,	*40	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125 60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
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COLONIAL AND FOREIGN REPRESENTATIVES AT OLYMPIA.

The following list of the representatives of Colonial and Foreign Governments at the Olmypia Aero Show has been supplied by the Society of British Aircraft Constructors :—

Agentine.—Argentine Naval Commission in London. Address : 2, Evelyn Mansions, Carlisle Place, S.W.1.

Australian Commonwealth.—Major W. A. Coates, M.C., and Lieut. Vautin. Address : Australia House, Strand, W.C.2.

Belgium.—Two Belgian Flying Officers have been specially appointed, together with the Belgian Air Attaché in London, Lieut. Chevalier Willy Coppens, D.S.O. Address : Belgian Embassy, 35, Grosvenor Place, S.W.1.

Brazil.—Commander Oscar de Souza Spinola, Naval Attaché to Brazilian Legation, 19, Upper Brook Street, Mayfair, W.

Canada.—The Canadian Liaison Officer in London, Major D. R. McClaren, D.S.O., Canadian Air Board, Air Ministry, Kingsway, W.C.2.

Chili.—Commander Francisco E. Merino, Naval Attaché to Chilean Legation, 22, Grosvenor Square, W.1.

China.—Commander S. K. Chen, Chinese Naval Attaché, c/o Chinese Legation, 49, Portland Place, W.1.

Crown Agents for the Colonies.—W. Braut, Esq. (Contracts Branch), J. W. Norris, Esq. (Inspection Branch), and F. Gregson Williams, Esq. (Designs Branch). Address : Crown Agents for the Colonies, 4, Millbank, S.W.1.

Finland.—Major Mikkola, Lieut. Durchman, and Ensign Leijer, officers of the Finnish Flying Corps. Address : Finnish Legation, 2, Moreton Gardens, S. Kensington, S.W.

France.—A special delegation consisting of eleven members in all, representing Military, Naval, and civil authorities, was appointed. Address : c/o French Air Attaché, 7, Norfolk Street, Strand, W.C.2.

Greece.—Mr. P. Tringhetas, Commercial Secretary to Greek Legation, 35, Knightsbridge, S.W.

Japan.—Lieut.-Commdr. M. Hoti, Imperial Japanese Navy, Broadway Court, Broadway, S.W.1.

New South Wales.—Mr. F. C. Govers, Department of the Agent General for New South Wales, Australia House, Strand, W.C.2.

Norway.—Norwegian Army Flying Corps : Col. Gustaf Grüner (Inspector-General of the Norwegian Army Flying Corps), and Capt. Sem-Jacobsen (Chief of Norwegian Army Aeroplane Factory). Address : Hyde Park Hotel, W.

Norwegian Navy Flying Corps : Lieut. Johan Johansen, c/o Comm. S. Scott Hansen, Naval Attaché, Norwegian Legation, 7, The Grove, The Boltons, S.W.

Ontario.—Agent General for Ontario, 163, Strand, W.C.2.

Peru.—A member of the Peruvian Legation in London attended on behalf of the Peruvian Government. Peruvian Legation, 104, Victoria Street, S.W.1.

Poland.—Capt. Borejsza, and Mr. Haber-Wlynski, for Polish Military Aviation Authorities Polish Legation, 13, Eaton Square, S.W.

Queensland.—Agent General for Queensland, 409-410, Strand, W.C.2.

Roumania.—Col. R. Rosetti, Military Attaché (for Roumanian War Office), 3, Marble Arch, W.

Serbia.—Col. Milivoye Yoksimovitch arrived in this country as a special representative of the Serbian War Office. In addition, the Serbian Military Attaché, Col. de l'Etat, Major Georges Ostoitch, C.B., has been appointed.

South Africa.—Lieut.-Col. Sir H. A. van Ryneveld, D.S.O., Room 642, Air Ministry, Kingsway, W.C.2.

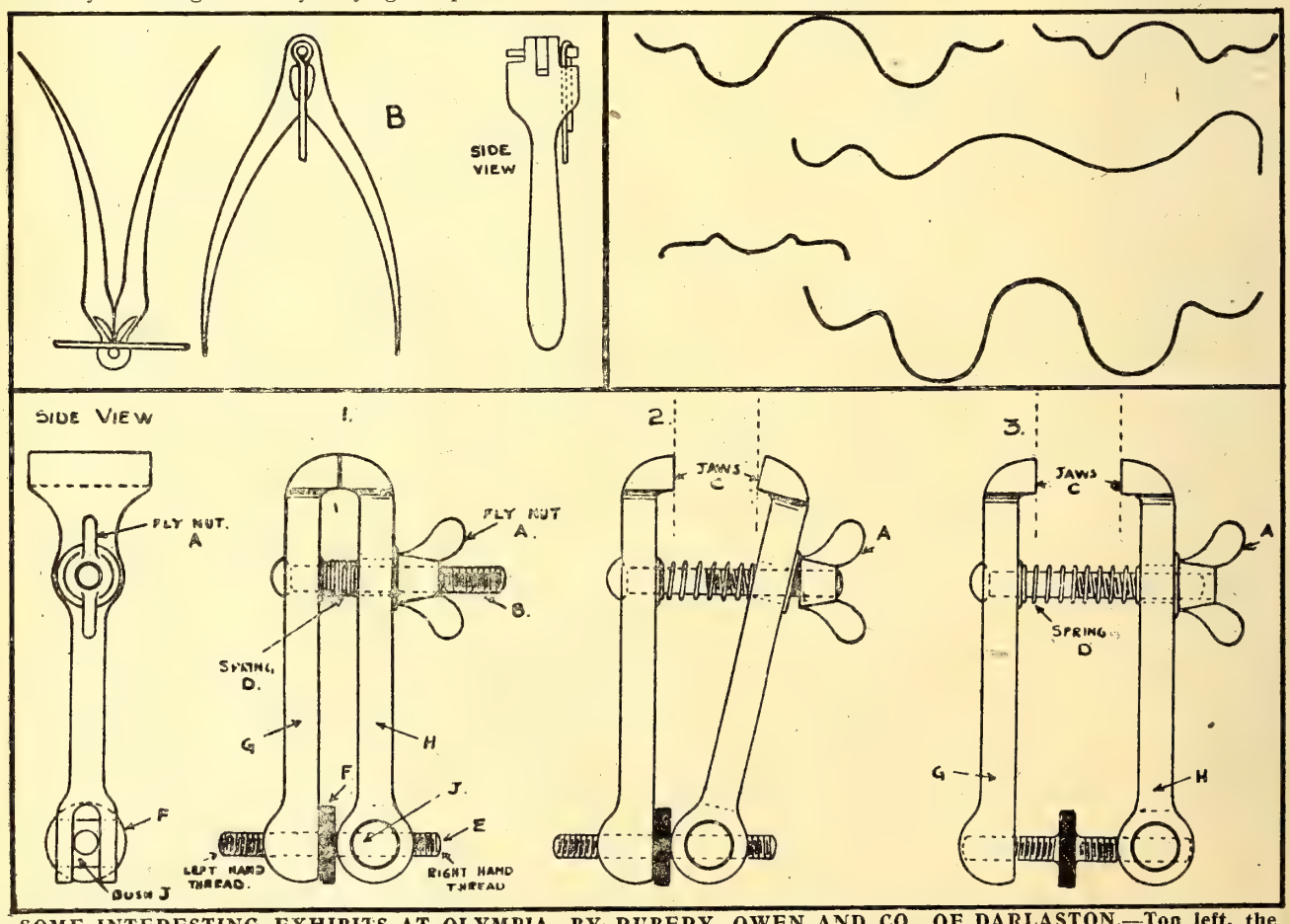
South Australia.—The Agent General for South Australia, Australia House, Strand, W.C.2.

Sweden.—Lieut. D. Tiselius, Naval Attaché, 73, Portland Place, W.1.

Tasmania.—The Agent General for Tasmania, Australia House, Strand, W.C.2.

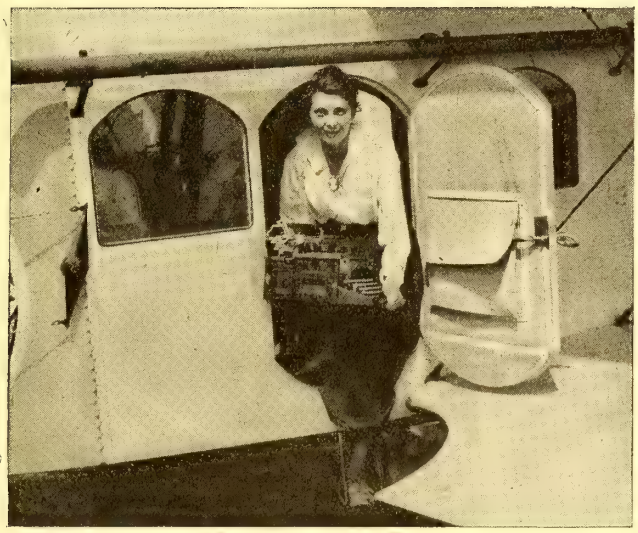
U.S.A.—Major Melvin A. Hall, Assistant Military Attaché for Air Service Duties, in the absence of a special delegation, represented the U.S.A. Army Air Service and all other U.S.A. Government Departments using aircraft except the Naval Department, which was represented by Lieut.-Com. D. C. Ramsay, Aide d'Aviation to Naval Attaché : American Embassy, Military Attaché, 4, Grosvenor Gardens, S.W.1. Naval Attaché, 28, Grosvenor Gardens, S.W.1.

Victoria.—The Agent General for Victoria, Melbourne Place, Strand, W.C.2.



SOME INTERESTING EXHIBITS AT OLYMPIA, BY RUBERY, OWEN AND CO., OF DARLASTON.—Top left, the "Fox" patent wire benders; Right, typical sections of rolled steel strips for the construction of steel wing spars, called by a humorist "mesmerised strip." Bottom, the Rubery, Owen patent parallel hand vice in various positions. No. 2 is that in which it should NOT be used.

WESTLAND



The comfort and steadiness of the **WESTLAND LIMOUSINE** is emphasised by the above picture.

The Typist is just alighting from the aeroplane with her typewriter after an aerial trip.

The **LIMOUSINE** is quiet enough and steady enough to enable one to talk and write without difficulty while in flight.

We are ready to quote for passenger trips to anywhere in England or on the Continent from our Aerodrome at Yeovil.

For full particulars and arrangements as to trial flights apply to the

WESTLAND AIRCRAFT WORKS

(Branch of Petters Limited)

YEOVIL.

Telephone:
141 and 142 YEOVIL.

Telegrams:
AIRCRAFT, 141 YEOVIL.

COMPANY NEWS.

Mortgages, Charges, and Satisfactions.

R. G. Toms Aviation and Motor Co., Ltd. (renamed Cadogan Carriage Co., Ltd.).—Satisfaction in full on June 1st, 1920, of debentures dated Aug. 21st, 1917, securing £1,150.

United Aircraft Co., Ltd.—Debentures dated June 18th, 1920, to secure £5,000, charged on the company's undertaking and property, present and future, included uncalled capital. Holder: F. J. Osborn, 4, Great Marlborough Street, W.

Great Northern Aerial Syndicate, Ltd.—Mortgage on certain debts and money dated June 5th, 1920, to secure all moneys due, or to become due, from Co. to Union Bank of Manchester, Ltd., not exceeding £300.

Grahame-White Co., Ltd.—Charge on motor-car bodies completed and in course of construction and parts designed for the construction thereof at Hendon, or in transit therefrom, to mortgagees, pursuant to their order, dated June 29th, 1920, to secure all moneys due or to become due from company to A. Harper, Sons and Bean, Ltd.

Receivership.

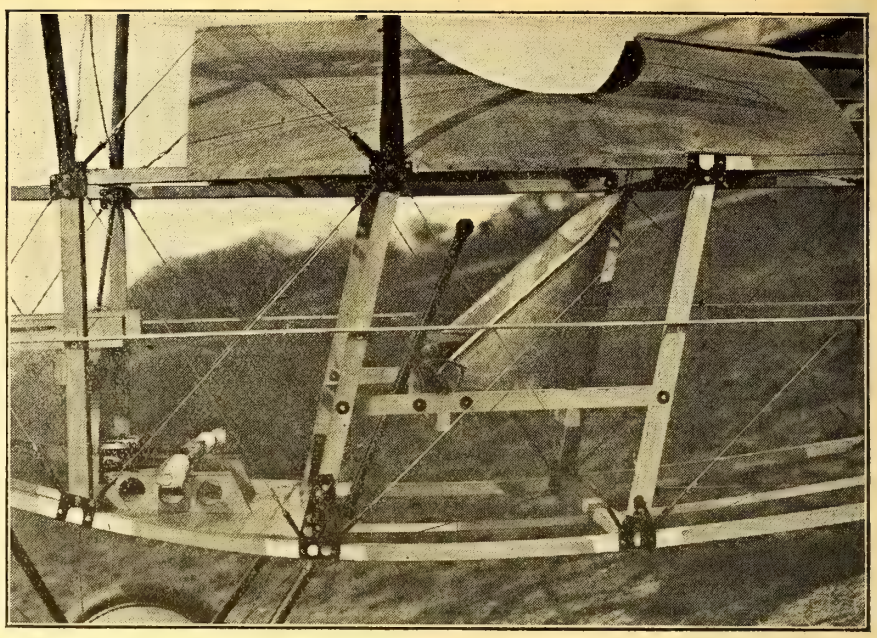
Peter Hooker, Ltd.—A. W. Tait, of Basildon House, Moorgate Street, E.C., as receiver and manager on June 30th, under powers contained in debentures dated May 19th, 1920.

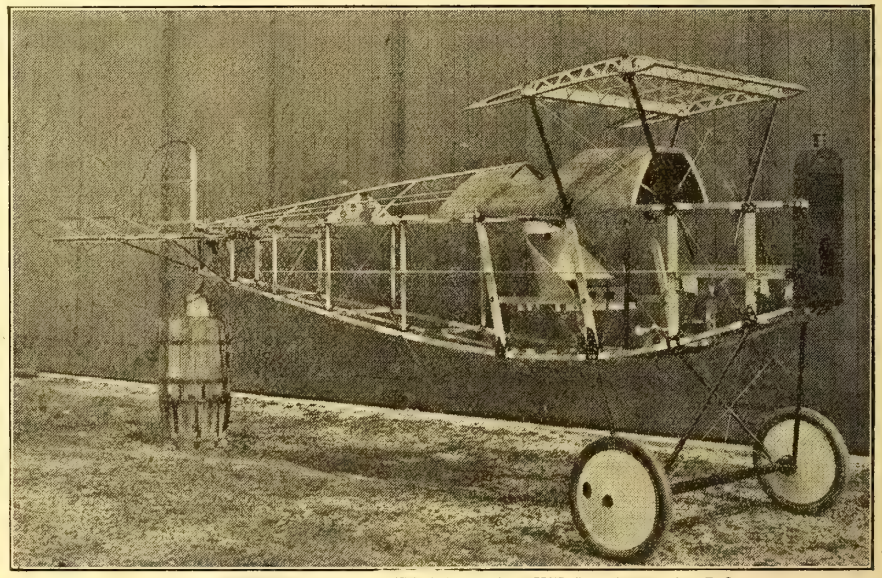
BY ERROR.

Owing to a printer's error the new Gwynne-Clerget 100-h.p. engine described on page 196 of The Aeroplane of July 21st was described as the 9.Z. type. This should have been type 9.J. This interesting engine should be of very considerable interest to designers and constructors of the smaller types of aeroplanes and doubtless will be the subject of much corespondence. Therefore it is eminently desirable that the particular type letter should be correctly stated.

INTERESTING DETAILS.

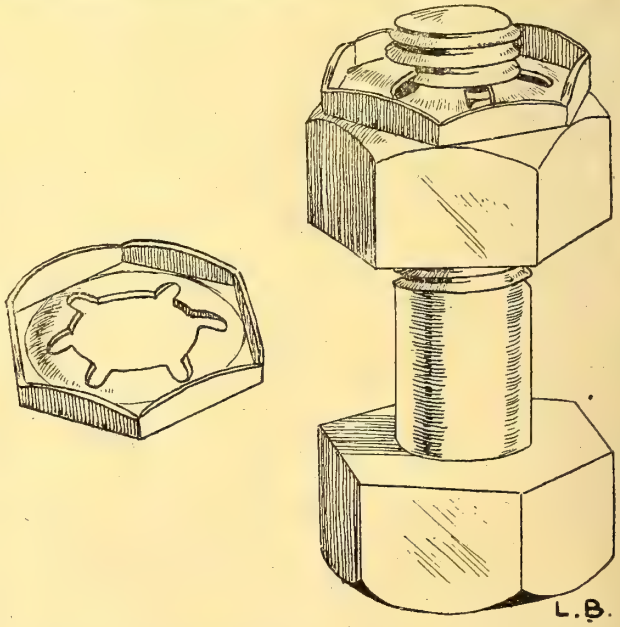
As this section of The Aeroplane is going to press it becomes known that the "Baby" Avros with 35-h.p. Green engines have taken first and second places in the Handicap Race in connection with the Aerial Derby. Therefore the accompanying details of that machine will be found of special interest.





CONSTRUCTIONAL DETAILS OF THE BABY AVRO.

DISPOSAL STOCK.—A neat caravan made almost entirely of scrap aeroplane materal by the "NAVARAC" Company of Cambridge. The wheels, springs and undercarriages are all aeroplane parts. The ladder is made of streamline struts.



THE "PALNUT" LOCKING DEVICE.—This consists of a sprung steel stamping hexagonal outwardly, and internally provided with projecting tongues bent up to fit the pitch of the bolt whereon the "Palnut" is fitted. It is simply screwed down tight above the nut when the spring of the tongues gives a grip sufficient to lock the nut proper.

The Original NON-POISONOUS.

Titanine Dope

is strongly recommended for

PRIVATE and COMMERCIAL AEROPLANES.

Absolutely unequalled for Durability.

There is no **CONTROL** on Dope for the above types of machines.

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Telephone : Gerrard 2312.

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Agents for Australia :

Messrs. Larkin-Sopwith Aviation Company of Australasia, Limited.

Melbourne Office : "Aberdeen House," 94, King Street.

Sydney Office : "London Bank Chambers," Corner of Pitt and Moore Streets.

Beardmore

AMONG THOSE WHO FLY BEARDMORE RELIABILITY IS A BY-WORD

These famous power units are being installed by many of the leading Aircraft Manufacturers in their most recently designed machines.

The names of only a few fitted with the 160 h.p. Beardmore Engine are given below.

Armstrong-Whitworth F.K.8.

Avro 5-seater Triplane.

Sporting Short Seaplane.

The Central Aircraft Coy's Passenger-carrying Limousine.

Aeronautical Engineering says of the latter "By using two of the 160 h.p. Beardmore Engines a power plant of proved reliability known to call for very low maintenance costs is attained."

BEARDMORE AERO ENGINES, LTD.,
112, Great Portland Street, London, W.1.
Telephone : 238 Gerrard.
Works = Parkhead Steel Works, Glasgow.

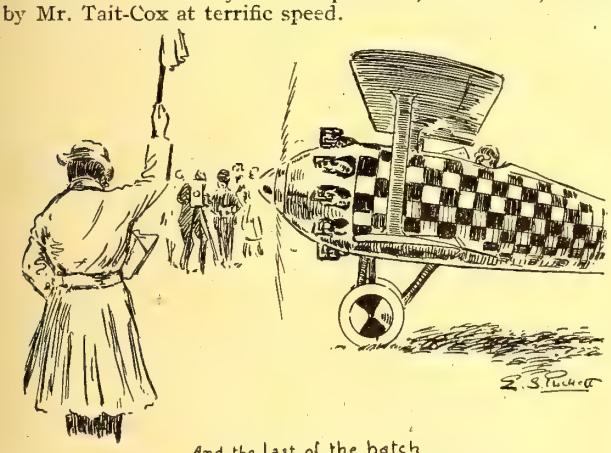
AeroEngines

(*Continued from page 246.*)

The Semiquaver makes a prestissimo start, and a good finish for the picture men.

that he flew an unnecessary lap of the pylons. The start of the two Martinsydes was as good as anything else Martinsyde.

Mr. Hawker's start was most sensational. As he streaked off to Brookland, S.A. and E.C.L. decided to build 47,237 aeroplanes per war. Then with a roar "Semiquaver," with the whole of Mr. Courtney curled up inside, dashed off, followed by Mr. Tait-Cox at terrific speed.



And the last of the batch
Was the man they call "scratch".

Shortly after this Mr. Cotton appeared at a great height, not taking any chances if Hendon did a disappearing trick like the Italian aerodrome which he failed to meet *en route* for the Cape.

As Capts. Jordan and Longton appeared racing round the pylons within a rod, pole, or perch of one another, the S.A. and E.C.L. decided to build 7,237 aeroplanes per war for the Balkan States.

Mr. Hawker, on the Sopwith "Rainbow," then appeared flying high and very fast. S.A. and E.C.L. decided to build 20,237 machines per revolution for Mexico. "Semiquaver," which one had last seen sitting so nice and still at Olympia, seemed in a tremendous hurry about something. One looked at one's watch and it was not nearly closing or opening time.

Soon after this Capt. Hamersley finished, followed by Mr. Hinkler. After a pause Mr. Hawker appeared and S.A. and E.C.L. decided to quote contracts to Esquimos for 9,237 machines. However, apparently fearing to be disowned by the *Daily Mail* if he qualified for a prize, Mr. Hawker failed to cross the finishing line. S.A. and E.C.L. decided to build millions of motor scooters for obese brass hats.

Then came the *pièce de resistance* of the afternoon, Mr. Courtney, whom one can number among one's instructors, and, therefore, be as rude about as one can. With taps and everything wide open that would open, he flew post the post and turned into the wind to land. Then he brought off a real Martinsyde-Cox-Farnborough-1915 landing and finished upside down. For a moment there was silence. Then cheer after cheer broke out as coil after coil of Mr. Courtney came out of the machine, much in the same way as a conjurer produces yards and yards of paper-ribbon out of a hat. Everyone was glad to hear that he was only shaken, and not even kinked.

The second place went to Mr. James' Nieuport. It must have been considerable consolation to Mr. Tait-Cox, after his own disappointment, to hear that his second string had done well. If Mr. James' start had not been delayed, and/or if he had not been wrongly instructed about the circuit at the aerodrome, he would probably also have made third place in the handicap. He tells one that his engine was perfect

Short-sighted youth mistakes the Official Starter for the Chocolate Man.

throughout. Mr. Uwins, who very wisely nursed his engine right through, was a good third.

Most people imagined that as the meeting was run by the Royal Aero Club the bookmakers who were present met with their approval and were to be trusted. They were sadly disillusioned in many cases. One has hopes that the Club did something for all those who helped to popularise the race and so put money in the Club's metaphorical pocket by displaying their Derby announcements free of charge, and one also hopes that it was an isolated case in which the Club refused one free ticket (after he had already bought and paid for six) to a person who had spent the previous Saturday afternoon and Sunday morning in distributing their posters.

G. D.

THE AERIAL DERBY FROM BROOKLANDS.

The few people on the aerodrome were sufficiently enthusiastic but amusingly ignorant at times of the identity of the machines. The hangars were tightly closed, presenting a most inhospitable aspect to the visiting machines.

At approximately 14.32 a speck was descried low down in the sky in the north-north-west direction, and proved to be Mr. Bert Hinkler's Avro "Baby," which passed over the white cross at 14.33.33, and turned towards Epsom, going very smoothly. Five and a half minutes later Capt Hamersley on his Avro "Baby" passed over, at an apparently greater speed than Mr. Hinkler, also quite low, the pilot's head being easily visible. Both machines turned very close to the mark and were soon out of sight.

After a wait of nearly fifty minutes the D.H.14a was heard in the distance, and the imposing machine was soon seen, rather high, but travelling well, the note of the Napier "Lion" being very true. Some people must think an 80-h.p. Le Rhone a noisy engine, for a few spectators joyfully proclaimed the machine to be Mr. Jensen's "Spad," until the number became visible. To contrast the D.H.14a with the Avros was interesting.

The first excitement of the afternoon was provided by the three "Snipes," which arrived simultaneously at 15.40.05, quite low and almost level with each other, Capt. Jordan being on the right, Flt.-Lieut. Longton in the centre, and Squad.-Leader Fall on the left. Capt. Jordan flew a little wide at the turn, and lost some ground, while the centre machine took a slight lead as the three machines dived over the cross, presenting a remarkable sight as they banked in unison, their Bentley engines snarling rhythmically. These machines were doing between 145 and 150 m.p.h. Some seven and minutes later the Avro "Schneider" projected itself over the aerodrome, and shot off to Epsom at a great speed, the cowling and radiator shining conspicuously.

At 15.54.31, Capt. Hamersley reappeared, flying as well as ever, followed half a minute later by Mr. Nisbet on the F.6, which turned very gracefully and seemed to be going like clockwork. At 15.56.03 Mr. James's jazz-painted "Nieuhawk" whizzed over, easily the fastest machine so far, with Mr. Hinkler on his tail. Mr. Hinkler's Avro seemed in a bad way, his speed having dropped considerably and the Green not pulling so well as on his first appearance.

The Martinsyde F.4 rounded the mark at 15.56.30, "all out" and fast overhauling Mr. Hinkler. Almost simultaneously Mr. Hawker passed over, quite high, but making a great speed and passing the F4, the "Dragonfly" firing very evenly.

Almost precisely at 16.00 the Bristol "Bullet" shot over and banked sharply, its speed being apparently in the region of 160 m.p.h.. The almost square rudder and fin stood out very prominently, as did the N interplane struts and the bulge in the centre of the fuselage

Five and a half minutes later, having already picked up one minute, the tiny "Semiquaver" flashed by, its beautiful lines showing clearly at the turn and the red fuselage adding to its effective appearance. The Hispano was roaring grandly, and the machine, evidently perfectly handled by Mr. Courtney, was enhancing its reputation.

A minute later the scratch man, Mr. Tait-Cox, hove in sight on the Nieuport "Goshawk," but as he took the turn his engine was "missing" badly He flew on for a short distance and turned back into the aerodrome, making a perfect landing into the wind. The trouble was sooted-up plugs. The machine was left on the aerodrome till later in the evening, when one believes it was flown away. The "Goshawk" just cleared a belt of trees bordering the motor track and made quite a flat glide

At 16.24.30 Mr. Cotton passed on the D.H.14a, still going merrily. Ten minutes later Capt. Jordan and Flt.-Lieut. Longton turned, on the Snipes, still almost level, and travelling fast. Flight Lieut. Longton was perhaps a second or two behind the other Snipe. Mr. James, on the "Nieuhawk," followed soon after, making a sharp turn.

Three minutes later Mr. Nisbet passed, followed after an interval of two minutes by Mr. Hawker and Mr. Courtney, both the latter having amazing speeds, with the "Semiquaver" a shade faster. At 16.48.26 the Bristol "Bullet" passed for the second time at a great pace, and three minutes later, at 16.51.31, the last machine, Sqdn.-Ldr. Hubbard's F.4, flew over low down, turning well over the mark, but having lost some of its speed.

At 17.00 (or 5 p.m.) Brooklands presented its usual stolid appearance, except for the presence of the blue and yellow chequered "Goshawk," with a small band of mechanics on guard, in the centre of the aerodrome.—J. F. S.

NAVAL AND MILITARY AERONAUTICS.

GREAT BRITAIN.

A Guest Day at Halton Camp.

The authorities at Halton Camp, Wendover, on July 24th, entertained the relatives of the boys under instruction. They reached Halton by special train and motor cars. They were given tea in the gymnasium by the officers and the boys. Later the boys conducted their relatives through the workshops. An athletic sports meeting was held, followed by an exhibition of physical training. Air Commodore Scarlett stated that similar gatherings were to be held annually before the summer furlough period.

L.64 Surrenders.

On July 22nd the second Zeppelin, L.64, ceded to Great Britain under the terms of the Peace Treaty, arrived at Pulham Air Station. The ship came over Ahlon in very bad weather and was navigated and handled by the same crew, under the command of Capt. Heine, as that which delivered the L.71. The L.64 is smaller than the L.71, and about the same size as R.34. She has five Maybach engines of 260 h.p.

On this occasion the sartorial arrangement of the British authorities for the reception ceremony was more dignified than in the case of the reception of the L.71, alongside which vessel the L.64 now lies.

The German crew exercised the same skill in handling the latter ship as that which was so admired on the arrival of the former.—G. D.

The Balloon-Apron Inventions.

Further evidence in regard to the invention of "balloon aprons" was heard by the Inventions Commission on July 26th. The cross-examination of Mr. E. T. Willows was continued. He stated that while attached to No. 7 Balloon Wing he succeeded in designing a successful "balloon apron," but as he could not persuade the authorities to continue the experiments he resigned.

The Viscount Tiverton, Mr. Willows' counsel, put in a statement by German prisoners saying that in May, 1918, a German aeroplane collided with an apron cable while flying at a height of 7,500 feet, was damaged, and fell 100 feet before control was regained.

The Commission concluded the inquiry and will consider its award.

To N.C.O. Pilots.

It has been suggested that a reunion dinner for N.C.O. pilots and observers shall be held later in the year. Past and present N.C.Os. who would like to be present at such a reunion are invited to write to the Editor of THE AEROPLANE, who will be pleased to put them in touch with one another so that they may form a committee and elect a secretary to make the necessary arrangements.

To Officers of No. 3 Squadron.

It is proposed that a reunion dinner of past and present officers of No. 3 Squadron, R.F.C. and R.A.F., shall be held this autumn. No. 3 Squadron is one of the permanent squadrons of the R.A.F., and therefore it is particularly desirable that past and present officers should meet on this occasion.

Those who would like to attend are invited to communicate with Flt. Lieut. J. K. Summers, R.A.F. Seaplane Station, Calshott, Hants.

NEW ZEALAND.

The New Zealand correspondent of THE AEROPLANE writes:

Parliament commences this month, and the much-desired report of the Air Adviser (Lieut.-Col. A. V. Bettington) should shortly be tabled. It was expected to have been made public long before this, but what with influenza and the visit of the Prince of Wales, Parliament was postponed.—B.

FRANCE.

The Military Aviation Budget.

Recently the Chambre des Députés approved of a Budget allocation for military aeronautics of 104,840,000 francs (normally £4,193,600). This sum has in the Senate discussion on the Budget been reduced to 100,000,000 francs (normally £4,000,000).

OFFICIAL NOTICES.

Owing to pressure on the space available, all official notices are held over until next week.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
July 19th	A.T. & T.	DH9	G-EAPL	London	Paris	05.07	10.50	Papers	Nil	Bamber
	A.T. & T.	DH16	G-EALU	London	Paris	09.30	11 25	Goods	2	Tebbitt
	A.T. & T.	DH16	G-EASW	London	Amsterdam	10.45	13.20	Goods	1	Game
	A.T. & T.	DH9	G-EAPU	London	Paris	12.00	14.15	Goods	1	Reeve
	Franco-Roumania Co'y	Potez	F-FRAA	London	Paris	12.15	14.05	Nil	1	Bajac
	I.A.L.	"Vimy"	G-EASI	London	Paris	12.47	15.25	Nil	1	Chattaway
	H.P. & M.A.	Breguet	F-CMAB	London	Paris	16.35	19.05	Nil	1	Challaux
	A.T. & T.	DH16	G-EALM	London	Paris	16.48	18.55	Mail	3	Armstrong
	A.T. & T.	DH9	G-EAGY	London	Paris	16 50	19 00	Nil	2	Lines
	A.T. & T.	DH18	G-EARI	Paris	London	09.45	12.30	Goods	4	Powell
	C. des G.E.A.	Goliath	F-GEAB	Paris	London	11.15	14.55	Goods	2	Labouchère
	Private	Sopwith 1½ Strutter	F-ABEP	Paris	London	—	15 25	Nil	1	Arnott
	A.T. & T.	DH9	G-EAPU	Paris	London	16.30	19.05	Nil	2	Reeve
	A.T. & T.	DH9	G EAPL	Paris	London	16.35	19.35	Nil	2	Bamber
July 20th	A.T. & T.	DH9	G-EAPU	London	Paris	04.52	07.00	Papers	Nil	Reeve
	A.T. & T.	DH18	G-EARI	London	Paris	09.39	11.45	Gds& M.	6	Powell
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10.15	13.20	Nil	1	Bamber
	A.T. & T.	DH16	G-EALM	London	Paris	18 15	20.30	Nil	4	Lawford
	A.T. & T.	DH16	G-EALM	Paris	London	09 55	12.15	Goods	1	Armstrong
	A.T. & T.	DH9	G-EAPU	Paris	London	10.00	12.27	Nil	2	Tebbitt
	I.A.L.	'Vimy'	G-EASI	Paris	London	13.30	16.30	Nil	4	Chattaway
	A.T. & T.	DH18	G-EARI	Paris	London	16.50	19.20	Goods	4	Powell
	A.T. & T.	DH16	G-EASW	Amsterdam	London	15.20	18.50	Nil	1	Game
	A.T. & T.	DH9	G-EAGY	Paris	London	16.55	19 40	Nil	2	Lines
July 21st	A.T. & T.	DH9	G-EAPU	London	Paris	04.52	07.30	Goods	Nil	Forson
	A.T. & T.	DH18	G-EARI	London	Paris	12 05	14 30	Gds& M.	7	Powell
	A.T. & T.	DH9	G-EAQL	London	Paris	12.05	14.30	Goods	1	Lines
	A.T. & T.	DH16	G-EASW	London	Amsterdam	12.05	14 52	Nil	1	Game
	C.T.	Nieuport	F-CGTI	Paris	London	12.00	19.40	Mail	Nil	Le Comte
	A.T. & T.	DH9	G-EAPU	Paris	London	14.40	18 15	Goods	Nil	Reeve
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	15.25	19 15	Gds&M.	2	Bamber
	A.T. & T.	DH18	G-EARI	Paris	London	17.00	19.15	Nil	4	Powell
	A.T. & T.	DH16	G-EALM	Paris	London	—	19.40	Goods	Nil	Lawford
July 22nd	A.T. & T.	DH9	G-EAPU	London	Paris	05.57	09.55	Papers	Nil	Armstrong
	A.T. & T.	DH9	G-EAPL	London	Paris	09 58	—	Goods	Nil	Milnes
	I.A.L.	"Vimy"	G-EASI	London	Paris	12.40	15.20	Nil	4	Chattaway
	C. des G.E.A.	Goliath	F-GEAB	London	Paris	12.40	15.50	Goods	Nil	Labouchère
	C.T.	Nieuport	F-CGTI	London	Paris	13.20	15.55	Mail	Nil	Le Comte
	A.T. & T.	DH16	G-EAPM	London	Paris	13.06	16.20	Nil	Nil	Tebbitt
	Vickers Ltd,	"Viking"	G-EASC	London	Antwerp	16.45	18.45 Brussels	Nil	2	Cockerell
	A.T. & T.	DH18	G-EARI	London	Paris	17.00	20.10	Mail	6	Powell
	H.P. & M.A	Spad	F-CMAV	Paris	London	—	14.45	Gds& M.	Nil	Bourdon
	A.T. & T.	DH16	G-EASW	Amsterdam	London	15.13	18.55	Gds& M.	Nil	Game
	A.T. & T.	DH9	G-EAPL	Paris	London	15.45	19.37	Nil	1	Lines
	A.T. & T.	DH16	G-EAPM	Paris	London	17.10	19.44	Nil	4	Armstrong
July 23rd	A.T. & T.	DH9	G-EAPL	London	Paris	04.45	07.25	Papers	Nil	Reeve
	A.T. & T.	DH16	G-EAPM	London	Paris	09 45	12.25	Nil	4	Armstrong
	A.T. & T.	DH16	G-EASW	London	Amsterdam	10.45	13.20	Goods	1	Game
	A.T. & T.	DH9	G-EAQP	London	Paris	11.15	14.00	Gds&M.	1	Bamber
	A.T. & T.	DH9	G-EAPU	London	Paris	17 00	20.00	Mail	1	Milnes
	A.T. & T.	DH9	G-EAPU	Paris	London	09.33	12.04	Goods	1	Milnes
	A.T. & T.	DH9	G-EAPL	Paris	London	13.10	15.40	Goods	Nil	Reeve
	I.A.L.	"Vimy"	G-EASI	Paris	London	14.10	17.14	Goods	2	Chattaway
July 24th	A.T. & T.	DH9	G-EAPL	London	Paris	10.10	12.20	Mail	1	Lines
	H.P. & M.A	Spad	F-CMAV	London	Paris	11.00	12.50	Goods	Nil	Bourdon
	A.T. & T.	DH9	G-EAQP	London	Amsterdam	14.42	17.20	Goods	Nil	Reeve
	A.T. & T.	DH9	G-EAQL	London	Paris	17 18	19.00	Mail	2	Forson
	A.T. & T.	DH9	G-EAPU	Paris	London	10.00	13.15	Nil	2	Bamber
	A.T. & T.	DH9	G-EAQL	Paris	London	11.00	13.54	Goods	Nil	Forson
	A.T. & T.	DH16	G-EAPM	Paris	London	14.40	18.10	Nil	4	Armstrong

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M = Mail.	No of Passengers.	Pilot.
July 24th	A.T. & T.	DH9	G-EAQP	Paris	London	* 18.30 23rd	12 52	Nil	Nil	Tebbitt
	A.T. & T.	DH16	G-EASW	Amsterdam	London	15.33	18.20	Gds&M.	3	Game
	A T. & T.	DH9	G-EAPL	Paris	London	16.45	18.40	Nil	2	Milnes
	C. des G.E.A.	Goliath	F-GEAB	Paris	London	* 11.40 23rd	18.48	Nil	Nil	Labouchère
July 25th	A.T. & T.	DH16	G-EASW	London	Paris	10.05	12.20	Nil	4	Game
	A.T. & T.	DH9	G-EAPL	London	Paris	12 35	—	Nil	Nil	Armstrong
	C. des G.E.A.	Goliath	F-GEAB	London	Paris	12.35	—	Goods	2	Labouchère
	A.T. & T.	DH9	G-EAQL	Paris	London	10.20	12.36	Nil	2	Forson
	A.T. & T.	DH16	G-EAPT	Paris	London	13.45	15.50	Nil	3	Lasne
	A.T. & T.	DH9	G-EAPL	Paris	London	-	17 35	Nil	Nil	Armstrong
	A.T. & T.	DH18	G-EARI	Paris	London	* 16.58 23rd	17.35	Nil	Nil	Powell

The Air Port of Cricklewood.

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M = Mail.	No. of Passengers.	Pilot
July 19th	H.P. & M.A.	Hand'y Page	G-EASM	London	Brussels	—	17.40	—	—	
	H.P & M.A.	DH9	G-EAUI	London	Amsterdam	—	19.28	G'ds&M	1	
July 20th	H.P. & M.A.	Hand'y Page	G-EASN	Paris	London	12.27	16.00	—	2	
	H.P. & M.A.	Hand'y Page	G-EATH	London	Paris	12.10	16.50	Goods	8	
	H P. & M.A.	Hand'y Page	G-EASL	London	Paris	12.30	16.55	Goods	7	
	H P. & M.A.	DH9	G-EAUI	Amsterdam	London	11 30	14.50	—	1	
	H P. & M A.	Hand'y Page	G-EATG	London	Brussels	14.45	17.15	Mail	—	
	H.P. & M.A.	Hand'y Page	G-EASM	Brussels	London	15.00	—	—	4	
	H.P. & M A.	DH9	G-EATA	London	Amsterdam	16.05	—	Gds&M.	2	
July 21st	H P. & M.A.	Hand'y Page	G-EASL	Paris	London	12.25	16.15	Goods	5	
	H.P. & M.A.	Hand'y Page	G-EATJ	London	Paris	12 40	20 40	Goods	5	
	H.P. & M.A.	Hand'y Page	G-EATG	Brussels	London	15.00	—	—	—	
July 22nd	H.P. & M.A.	Hand'y Page	G-EATJ	Paris	London	12.40	—	Goods	6	
	H.P. & M.A.	Hand'y Page	G-EASY	London	Paris	12.00	15.10	—	8	
	H.P. & M.A.	Hand'y Page	G-EASN	London	Paris	12.10	15.25	Goods	6	
	H.P. & M.A.	Hand'y Page	G-EATK	London	Brussels	14.40	17.15	Gds&M.	3	
	H P. & M.A.	Hand'y Page	G-EASZ	London	Amsterdam	16.10	—	Gds&M.	1	
July 23rd	H.P. & M.A.	DH4	—	London	Brussels	11.50	14.00	—	—	
	H.P. & M.A.	Hand'y Page	G-EASM	London	Paris	12.10	16.40	Goods	5	
	H.P. & M.A.	Hand'y Page	G-EATH	Paris	London	12 10	15.46	Goods	1	
	H.P. & M.A.	Hand'y Page	G-EASY	Paris	London	12.12	15.46	—	4	
	Royal Machine	Bristol	A	London	Brussels	14.25	—	—	1	Foot
	H.P. & M.A.	Hand'y Page	G-EATK	Brussels	London	15.15	19.10	Mail	1	
	H.P. & M.A.	DH9	G-EAUI	London	Brussels	15.30	18.35	—	2	
	H.P. & M.A.	Hand'y Page	G-EASZ	Amsterdam	London	16.19	13.00 24th	Gds&M.	—	
	H.P. & M.A.	DH9	G-EAUH	London	Amsterdam	17.30	—	Gds&M.	2	
July 24th	H.P. & M.A.	Hand'y Page	G-EASY	London	Paris	12.15	14.55	Goods	10	
	H.P. & M.A.	Hand'y Page	G-EASL	London	Paris	15.30	14.55	Goods	5	
	H.P. & M.A.	Hand'y Page	G-EATN	Paris	London	12.55	17.35	—	4	
	H.P. & M.A.	Hand y Page	G-EATE	London	Brussels	13.40	15.25	—	—	
	H.P. & M.A.	DH9	G EAUI	Brussels	London	15.45	18 40	Mail	2	
	H.P. & M.A.	DH9	G-EATA	London	Brussels & Amsterdam	16.00	17.55 Brussels	Gds&M	1	
July 25 h	H.P. & M.A.	Hand'y Page	G-EASY	Paris	London	12 40	15.45	—	7	
	H.P. & M.A.	Hand'y Page	G-EASM	Paris	London	—	12.30	Goods	—	
	H.P. & M.A.	Hand'y Page	G-EATJ	Nouvion	London	—	09.30	—	—	

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; H.P. & M.A.—Handley Page and Messageries Aeriennes. I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company, M.W.T.C.—Marconi Wireless Telegraph Company.
Where times are missing it is probably owing to Atmospherics affecting signals.
* In cases where machines have been delayed a day, it has been owing to bad weather making it impossible to proceed.

Inland Flying at Croydon.

FROM JULY 19th TO 25th, 1920.

July 19th.—H.P. Co., 1 Avro, Cricklewood, return.
July 20th.—A.T.T., 1 Avro, test.
July 21st.—H.P. Co., 1 Avro, Cricklewood, return
July 22nd.—A.T.T., 1 D.H.16, test; Vickers, Ltd., Viking, from Weybridge.
July 23rd.—A.T.T., 1 D.H.9, test.
July 24th.—A.T.T., 1 D.H.9, photographs of Aerial Derby.
July 25th.—A.T.T., 1 D.H.9, 1 joy-ride; I.A.L., Vickers Vimy, 2 joy-rides.

The Air Port of Cricklewood.

The Bristol Fighter recently presented to the King of the Belgians was delivered by air to Brussels on the 23rd.

The Handley Page Co. state that a resident of Cricklewood has complained that low-flying Handley Page machines cause damage to his furniture by blowing soot down his chimney. One of these days he may find that it is more than mere air pressure will damage his house, if an engine "konks out" while a machine is taking off. It has already been said by a humorist that it is dangerous to stand up on a tram while passing the aerodrome.—G. D.

New Air Lines.

It is reported that a new air line will shortly be in operation between London and Copenhagen via Amsterdam and Hamburg. The single journey will cost 900 kroner, or about £50, at the present rate of exchange. No details are yet to hand as to the name of the company who are running this line, but it seems that there will be plenty of room for other air lines if run at a considerable decrease in price. In a line of this length it would be run most satisfactorily on a relay system.

H.P. and M.A. now have a working arrangement with S.N.E.T.A. for through tickets by air to Antwerp via Brussels. The S.N.E.T.A. has for some time been in operation between Brussels and Antwerp.—G. D.

The Air Mails.

The P.M.G. announces that from July 22nd the fee for letters sent by air to Paris and Brussels will be 2d. over the ordinary letter fee, and on the Amsterdam service the extra will be 3d. The charge for express delivery will be 6d.—G. D.

Farnborough.

The sports of the Royal Aircraft Establishment Athletic Club will be held on Aug. 14th in the field behind the factory. The programme includes the usual open and closed events, and will be followed by a dance in the evening. Mrs. Sidney Smith, wife of the Superintendent of the Establishment, has consented to distribute the prizes.—J. F. S.

Folkestone.

An aeroplane belonging to the H.P. and M.A. Airline, carrying mails between Amsterdam and London, on July 21st, owing to bad weather, was compelled to land on the beach at Folkestone, on the eastern side of the harbour. The machine buried its nose in the shingle and the airscrew was broken, but neither the pilot, Mr. Fowler, or passengers (of which there were two) were hurt.

An Avro seaplane brought to Folkestone by Mr. S. A. Martindale (formerly a Flight Commander in the R.A.F.), and piloted by Major Ferrand, D.S.O., late R.A.F., is giving passenger flights on every suitable day. Consistent support is given by the Earl of Radnor (Lord of the Manor) and the Mayor of Folkestone.

Guildford.

The annual sports of the Martinsyde Recreation Club, held this year on July 17th, at Guildford Sports Ground, were again very successful. Some fine running and other athletics were witnessed, including the winning of the 120 yards hurdle race in 18 sec. by C. R. Erdman, of Princeton University (U.S.A.), from 22 yards behind scratch.

The scratch mile race for works' employees was won by Portass, of Martinsyde, Ltd., while Shonbridge, also of Martinsyde's, was third. R. Rayer (Martinsyde) won the works' long jump, with Sims (Martinsyde) second. Rayer also came second in the works' trophy high jump, which was won by a Dennis Motors' man. The Martinsyde tug-of-war team were beaten in the semi-final by Drummonds, who won in the final. H. E. Ryan (Polytechnic) and D. Cutmore (Sussex champion) were respectively 1st and 2nd in the 5 miles' invitation scratch cycle race. The Martinsyde Pierrot Troupe and Orchestra gave enjoyable concerts during the evening.

Mr. F. P. Raynham was one of the judges. Mrs. H. P. Martin, wife of Mr. H. P. Martin, President of the Club, presented the prizes to the winners.—J. F. S.

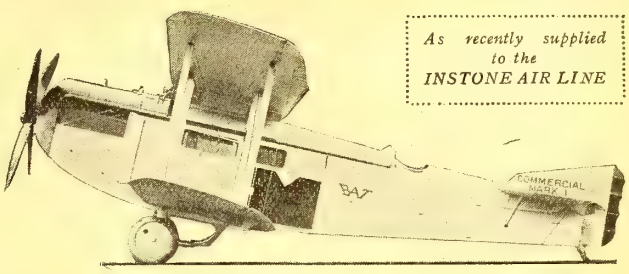
Mansfield.

Miss Anne Sissons, a damsel of 101, has recently made two flights with Mr. Herbert Sykes. As a companion on the second trip she had an ex-postman, probably recently promoted from a telegraph boy, aged 84. Miss Sissons now desires to loop the loop. Girls will be girls, and youth will out.

G. D.

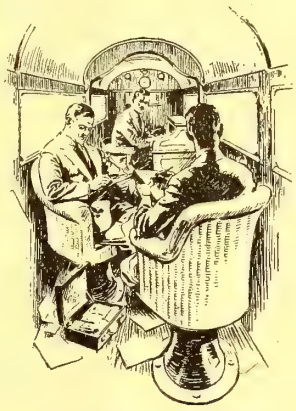
Northolt.

The "Centaur 2a" 9-seater twin-engine biplane is now undergoing an overhaul before the Government competition



As recently supplied to the INSTONE AIR LINE

The Ideal Commercial Aeroplane



An impression of the interior fitted out as an aerial office.

The machine here illustrated is the B.A.T., universally acknowledged to be the most practical and efficient commercial aeroplane yet produced. Although a relatively small machine—only 34 feet over-all length—it possesses surprisingly commodious cabin and cargo accommodation. Four passengers can be carried comfortably, with ample room for personal luggage, or, alternatively, parcels or mails to the extent of 1,000 lbs. in weight and **150 cubic feet in capacity.**

The B.A.T. as a commercial machine has so many natural advantages and is so moderate in first cost, that it is really the ideal machine to employ in inaugurating air transport services

A demonstration flight can be arranged and all particulars obtained on application to:—

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38, CONDUIT ST. LONDON W.

The "Bristol" Aeroplanes

were the subject of close inspection and enthusiastic comment on the part of those who attended the recent Aero Show. The following extract from a letter in our possession is typical of the interest displayed:

"At the close of the Aero Show at Olympia, I feel I should like to write and tell you of the extraordinary interest and admiration which have been aroused by your wonderful exhibit, the 'Bristol' Triplane. No one with any interest in aviation could fail to be aroused to something like enthusiasm by so wonderful a proof of the strides recently made in the science of aviation."

To those who were unable to attend the Show we shall be glad to send illustrated details of our exhibits.

THE
BRISTOL AEROPLANE CO., LTD.
FILTON — BRISTOL.

Telegrams: "Aviation, Bristol." *Telephone:* 3906 Bristol.

at Martlesham Heath on Aug. 2nd. This machine has been in regular service since March of this year, but it is understood that the 160-h.p. Beardmore engines are being replaced by 230-h.p. Siddeley "Pumas."

The North London Motor Cycling Club visited the Central Aircraft Company's Aerodrome, Northolt, on Sunday, July 25th, and spent an afternoon flying and watching others fly. Over 150 members turned up and inspected aeroplanes and aeroplane engines in the various stages of construction. Great interest was shown in the big nine-seater twin-engined 2a.

On July 26th members of the South African Olympic Team, who are leaving for Antwerp to complete their training on July 29th, visited Northolt Aerodrome and were flown over London. As none of the members had previously flown, it was interesting for them to see London from the air.

Porthcawl.

Last Saturday and Sunday (July 17th and 18th) the Avro belonging to the Berkshire Aviation Coy. was flying till dusk. Over a hundred passengers were carried during the week-end. The remaining part of the week has been very quiet, due to the March-like weather.

It is surprising the number of people that visit the aerodrome just to see and touch the machine (many visitors from the valleys have never seen a machine on the ground before) and if possible to write their names upon the planes.

Preston.

The Giro Aviation Co., who have been flying at Preston Aerodrome, have carried during the past fortnight over 300 passengers. They were expecting to migrate to Prestatyn on the 24th inst., where they have obtained flying rights for the foreshore. After a week's stay there they will leave for another site which has not quite been decided on up to the present.

The Giro Aviation Co., whose offices are at 337, Royal Liver Building, Liverpool, are, in addition to "joy-riding" at various seaside resorts, open to carry passengers any distance within a radius of 100 miles of Liverpool.

THE BRITISH DOMINIONS BEYOND THE SEAS.

NEW ZEALAND.

The following notes have been sent from New Zealand and are dated May 29th :—

The Canterbury (N.Z.) Aviation Co., Ltd.

Since the management of the company was taken over by Captain Euan Dickson, D.S.C., D.F.C., Croix de Guerre, late Royal Air Force, last November, the whole of the East Coast of the South Island has been surveyed for aerial possibilities. The four 110-h.p. Le Rhone-Avros, purchased at home by Captain Dickson, on behalf of the company, arrived last January, and were immediately rigged and joy-rides undertaken.

A very successful flying day was held at Sockburn on Saturday, February 7th, Captain Dickson giving a thirty-minutes' stunt-flying exhibition, with his mechanic, Mr. J. E. Moore, as passenger, before a crowd of 6,000 people, and 34 joy-rides were made during the afternoon, Mr. J. C. Mercer acting as relieving pilot.

An Aerial Tour.

An aerial tour of the South Island was then planned, and on Tuesday, Feb. 17th, Captain Dickson left Sockburn on his flight southward to Invercargill. A few days were spent at each of the important townships on the way and passengers were carried between each stage of the journey. The majority of the people in the south had never before seen an aeroplane, and intense interest was displayed everywhere and a great reception was given the pilot and passengers at each landing stage. The tour lasted thirty-one days, during which approximately 530 passengers were carried, 16 stunt-flying exhibitions were given and the approximate distance flown amounted to 3,600 miles, without a single forced landing or mishap. The distance from Sockburn to Invercargill is 360 miles.

An Additional Pilot.

On May 2nd, Captain Douglas W. Gray, late R.N.A.S., R.A.F., took up an appointment with the company to assist Captain Dickson with the flying.

Aerial Survey of Proposed Flying Route to Mount Cook.

On May 20th Captain Dickson undertook another pioneer flight, this time to Mount Cook, some 190 miles away (air line 150 miles). As was arranged, he landed at Fairlie (a town situated in the Fairlie Basin, which is almost completely surrounded by hills varying from 2,000 to 6,000 feet in height) where he was given a great reception and entertained at luncheon. The next day he started off towards Mount Cook. First crossing a close range of hills some 5,000 feet in height he steered for the mountain (12,000 feet) which was then clearly visible. A strong head wind had in the meantime arisen so that very slow progress was made, and after an hour's flight he had attained an altitude of 13,000 feet and commanded a perfect view of the mountain, its surroundings and approaches. Immediately after his return to Fairlie a howling Nor' Wester sprang up, and though the Avro was heavily pegged down (with wheels dug in and tail raised to flying position), it was necessary to hang on the wing tips at times to stop her lifting. Captain Dickson and his mechanic (Mr. J. E. Moore) spent some anxious and unpleasant hours until well after midnight, standing by the machine in wind and snow. On the following morning advantage was taken of a lull in the storm and the pilot started off on his way to Christchurch. Experiencing a favourable wind on the way he reached the Sockburn aerodrome (110 miles) in exactly 63 minutes, thus making a speed of 100 miles per hour.

Other Cross-country Flights.

A number of shorter cross-country passenger flights have also been made—one about three weeks ago—being to a sheep station in the hill country some 95 miles from Christchurch. A landing was made in a small paddock by the homestead, business was transacted and one hour after the landing the propeller was again started by one of the passengers, who arrived back in town for lunch.

Pleasure Flights.

Since January last over 1,300 passengers have been carried on short joy-rides or cross-country flights.—C. R. H.

The New Zealand correspondent of The Aeroplane writes from Wellington of May 28th :—

The Return of New Zealand Aviators.

The final batch of New Zealand members of the Royal Air Force returned home by the *Ionic* a few days ago. They were Captains P. Fowler, M. Buckley, and Lieutenants G. Hood, C. H. Noble-Campbell, C. Umbers, C. Dolling Smith, H. Smith, and Administrator Shortridge, of the Women's Royal Air Force.

A German Aeroplane in New Zealand.

A German Albatros machine is at Trentham Camp awaiting the opening of the National War Museum. The machine, which was captured by Captain Murlis Green on a B.E.12, near Lake Doiran, Salonika has a history. When it was chased down the pilot was a German N.C.O. and the passenger a prince, believed to be a nephew of the Kaiser. Out-manœuvred in the air, the prince ordered his pilot to descend and surrender. Capt. Green flew the 'plane straight to Salonika, while the Germans were taken prisoners. It was shipped to Alexandria and sent to Abukir, where it was rebuilt and flown by Majors Millar and Peck. The aeroplane was exhibited at Cairo and at Alexandria War Museums.

The Canterbury Aviation Company.

It may be of interest to English readers to know the rates of charges made by the company. A ten minutes' flight, covering 11 or 12 miles, costs £5, and £2 10s. for every additional five min. These flights are circular trips in the district, taking off from the company's aerodrome and landing there again. Cross country trips cost £30 per hour, with an additional charge of £5 for every landing made outside the company's aerodrome. Aeroplanes may be hired by certified pilots only, at the following rates : Two-seater machine, £15 per hour, £100 deposit; single seater, £12 per hour, £50 deposit.

The following aeroplanes are at the Canterbury Aviation Company's aerodrome :—Four 504K Avro machines, fitted with 110 Le Rhone engines; eight Caudron machines, fitted with Anzani engines; two D.H.4 machines, fitted with 375 h.p. Rolls engines; and two Bristol fighters, fitted with Rolls "Falcon" engines.

The Bristol fighters and the D.H.4 machines belong to the New Zealand Government.

There are no new additions to the machines belonging to the Auckland Aviation School.

STRAITS SETTLEMENTS.

On May 30th T. K. Wong, Ltd., arranged a second flying demonstration as a part of their aviation propaganda. Captain S. S. Carroll, flying a Nieuport "Nighthawk" biplane with Mr. G. T. K. Wong as passenger, left Klang at 16.25 hours for Kuala Lumpur with a consignment of goods for Messrs. Whiteaway, Laidlaw and Co., at the latter place. A large crowd watched the departure. Captain Carroll looped, did the "falling leaf" and rolled, and then left for his destination. Kuala Lumpur, 20 miles from Klang, was reached in nine and a half minutes. Many letters were carried on the flight.

The machine remained at Kuala Lumpur.

A Suggestion from SHELL

1. Put a carefully-measured gallon of the petrol you are now using into your tank—
2. Record carefully the mileage it gives you—
3. Note the point to which it carries your car on your favourite test hill.
4. Now buy a can of SHELL and measure out a gallon—
5. Make precisely the same test, over the same roads, up the same test hill—
6. We await your decision with confidence.
7. We promise that you will find SHELL will take your car farther on a gallon and give you a bigger pull on hills than any other petrol in the world.
8. Petrols are no more "all alike" than are all lubricants, all waters, all climates. If you get any other petrol than SHELL you are paying for mileage and "pull" that you don't get.
9. Don't ask for No. 1 spirit—ask for SHELL.

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A double plastron of Burberry Gabardine across the chest and shoulders, a Burberry Puttee Collar, adjustable waist-belt, and devices for tightening the sleeves and legs, add comfort and stability to an outfit which ensures security, yet is much less weighty and cumbersome than leather.

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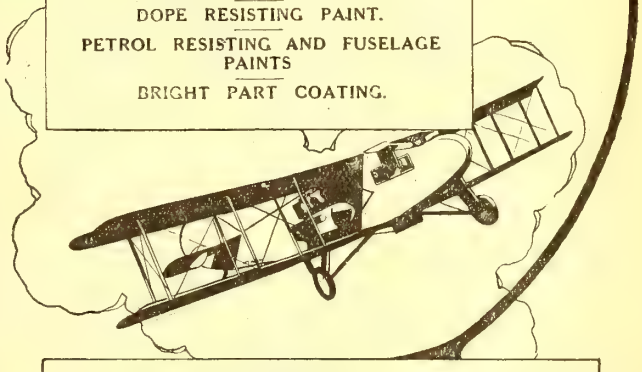

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FOREIGN INTELLIGENCE.

ARGENTINA.

The Italian correspondent of The Aeroplane writes :—

An Italian Flying School.

Supported by local banks and the Italian Government an Italian flying school is being shortly opened near Buenos Aires. Captain Laureati is to manage the enterprise, which is being run more as a Mission than as a paying business scheme. There are already present in Argentina six or more ex-Service pilots who went out some months ago, and machines are already on the scene, so that work should begin without delay.—T. S. H.

DENMARK.

The Danish correspondent of The Aeroplane writes :—

Official Information.

To foster civil aviation the Admiralty will in future to its "Report for Seafaring" add a section for air going traffic. The latter will include all news of interest mainly to naval aviators from the different institutions under the Admiralty, such as the cartographic and light-houses and ships, meteorological services and the flying-boat station, further later, perhaps, similar news to come from abroad. When the necessary conventions come out later the reports will also give full information of international air navigation conditions.

As flying over sea always includes the risks of breakdowns remaining unobserved, the engagement of 23 Danish light-houses and ships in the news reports of flying direction and time of passing aircraft and recording of their distinction should be a welcome to pilots. The news is transmitted by cable and wireless and is supplied free, and it is hoped that in planning out their routes pilots will in future take the support points into consideration. In Copenhagen information can be had on 'phoning the flying-boat station : Militar 155.

Commercial Aviation.

One understands that the Danish-American millionaire, John Larsen, has together with the Curtiss engine designer, Mr. Kirkman, had to do with the introduction of the first Junkers duralumin commercial limousine, which had such a poor start at the Mineola aerodrome.

Interrupted by the five years of war Mr. Larsen last year restarted his yearly combined pleasure and business visit to his various ice-production plants in Denmark and arranged his cruiser to take a flying boat on board. Piloted by the American Captain Batts, he took cinema pictures of most of the beauties of his old country from the air, and but for the delay in the return of Slesvig to Denmark would have been the first to have dropped "Dannebrog" from the sky there, which is the legend of the origin of the Danish flag. Before returning to America he paid Germany a visit and made a trip in the "Bodensee" airship, at which time he apparently also met the Junkers' people, who have long been known to have the intention of going ahead with their original product in the United States.

During his Danish stay Mr. Larsen left the impression of fostering Curtiss interests : his first flying boat of that make he sold for less than £1,000 in Norway on receipt of a larger one, which he after use presented to the Danish Naval Air Service.—Hi.

FRANCE.

A Franco-Roumanian Flying Company.

A company, known as the *Compagnie Franco-roumaine de Navigation Aérienne*, is in the course of formation with an initial capital of 3,000,000 francs. The company's office is at 194, rue de Rivoli, Paris. The first line to operate will be from Paris to Prague. This route will later be extended to Bucharest and to Constantinople.

Lieutenant de Fleurieu, a director of the company, who with Captain Deullin made some months ago a flight over the route Paris-Prague-Warsaw, intends to organise a regular aerial line between those places.

The machines to be employed are S.E.A. Potez, of limousine type, which under official observation have flown at a speed of 126 miles an hour.

A Paris-Constantinople Flight.

Lieutenants Peltier-Doisy and Genin, well known not only as pilots but as Rugby football players, left Toussus-le Noble on July 20th, at 07 05 hours, flying a Farman "Goliath" biplane. Their ultimate destination is Constantinople. They landed at Vienna in the afternoon.

The Toulouse-Rabat-Casablanca.

The Toulouse-Rabat aerial mail service has now extended its line to Casablanca, which is for the time being to be the southern terminus of the route.

Customs Aerodromes on the Swiss Frontier.

It is announced that aircraft proceeding from Geneva and Lausanne towards Lyon must land at Amberieu for Customs examination, and must pass over the Bellegarde zone. Those proceeding towards Paris must cross the frontier between les Verrières and Mouthe and are to land at Dijon for examination. Aircraft proceeding to Alsace-Lorraine must cross the frontier between Delle and Ferrette and will be examined at Mulhouse.

Seaplanes flying to the free zone of Haute Savoie must alight at Thonon or Evian, and those proceeding to the interior of France will cross the frontier at Bellegarde and alight for Customs purposes at Annecy.

The Tour of Lieut. Roget.

Lieut. Roget, who is making an aerial tour of Europe, reached Athens on July 17th from Constantinople.

HOLLAND.

It is announced from Rotterdam that the air line from London to Amsterdam will include Rotterdam as a stopping-place as from 26th inst.—C. D.

ICELAND.

The Icelandic Aviation Company.

Iceland, curiously aloof from the outer world, has now an aviation company—the Flugfélag Islands—to assist in the passage of the days. In summer there is almost ceaseless daylight in Iceland, the mountain tops are always crowned in snow, and hot springs bubble from the ground. It is a curious country and aviation has a great future within its boundaries.

One of the principal members of the Flugfélag Islands is Mr. Frank Friedrickson, a one-time pilot in the R.F.C. He is giving a series of exhibition and passenger flights at Reykjavik and in the eight days preceding July 4th had four days flying in which period he gave flights to at least seventy passengers.

He intends later to fly to the North of Iceland by way of the post route and telephone lines. On the way he will give exhibitions at all small towns where oil and petrol are available.

ITALY.

The L.A.N. Small Tourist Plane Trials.

The Italian correspondent of The Aeroplane writes :—

Called the "6-metres," this competition, limited to machines of not more than 40 h.p. and 6 metres span, took place in fair weather on the 4th and two following days of July, at Taliedo, Milan. Five machines of three types presented themselves for the qualifying tests and each did well in its own special line. The machines were described in this paper in the issue of January 28th last. Both the Macchi 16, with Anzani "Y" 30 h.p. engine, and that with the ABC 35 h.p. engine, were present. The Pensu, Breda-built, also was there in duplicate. So, with the Ricci fuselage triplane, they were five. Judging from all accounts the proceedings were eminently satisfactory both as regards the flying qualities of the machines and the airmanship of the pilots. Records were beaten incidentally and the fly in the ointment was, as usual, in all cases the engine.

The following communiqué issued some days afterwards puts the event succinctly and is to be followed by the Committee's detailed relation at a later date. In considering it, it is well to remember that the Macchi 16 has at least a third greater span than the other two entrants and considerably less h.p. and about one-sixth as much again of supporting surface as they. Altogether it is scarcely in the same class, which does not detract from its merits in the least.

The general summing up gives 82 out of 90 marks to the Macchi 16; 80 out of 90 to the Pensuti; and 74 out of 90 to the Ricci.

The first, therefore, takes the Queen Mother's prize, the second that of the Minister of Industry and Commerce; and the third that of the Commune of Milan.

The winners of each separate test are :—

Pensuti-Breda.—Pilot, L. Montegani, for quick pull-up, 42.60 metres, wins the Count of Turin's prize.

Macchi 16, Anzani.—Pilot, Be Briganti. Speed variation, from 50 to 124 k. per hour. Wins prize of Commandant of Milan Army Corps.

Macchi 16.—Best gliding time from 1000 metres, 8 min. 11 2/5 sec. Wins prize of the Prefect of the Province of Milan.

Pensuti.—For quickest take-off, 30 metres in 8 2/5 seconds. Itn. Ae.C.'s prize.

Pensuti.—For controllability, steering, on ground. Wins L.A.N.'s prize.

Macchi 16, Anzani.—Consumption of spirit, 71.5 gr. per kilo. Wins Scirea prize.

Macchi 16, Anzani.—3770 metres height record reached in the hour.

The League's first prize therefore goes to Macchi 16, Anzani, 3 cyl., 105 by 120; and the second prize to the Pensuti-Breda, 6 cyl., 90 by 120.

In view of the excellent results of the tests the committee decided to award a compensation for the technical progress displayed by the Ricci machine for its small dimensions and

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to the Macchi 16 for its climb and good gliding angle, and to the Ricci again for the high speed attained.

The communiqué concludes with warm compliments to designers and pilots. Bruno Albertazzi piloted the Ricci throughout. The machine did its long journey by Ford car, the weather being impossible for anything slower than a torpedo.

The judges were well-known practical men. Among the Service men of them were Major Baroni, the C.O. of Taliedo; Capt. Sacchi, who was the Chief Instructor for all the latter part of the war at Malpensa, and Lieut. Finzi of the Vienna "seven." The non-appearance of the Sarri, quite a new effort, and the Gabardini, which one almost doubted seeing since its designer does not believe in or think there is any demand for joy aeroplanes, removed considerable interest from the trials, while the absence of a decent crash propagated most effectually.

The SAIAM had a Breguét, a Caudron and a Saml on the ground, when not in the air giving joy rides, on both days as advertised.—T. S. H.

PERU.

A correspondent in Peru writes :—

An Italian-Peruvian Aviation Company in Lima.

The New Italian-Peruvian Aviation Co. has been definitely established on May last with considerable capital to encourage and develop flying within the territory. The Italian-Peruvian Aviation Co. will open the first aerial service between Lima and Iquitos in the Amazon region at an early date, and others elsewhere in the country, as soon as hangars and workshops have been erected.

A flying school will also be opened in the capital for training Peruvians, and will be equipped with the best type of school machines under certificated pilots of experience.

The type of machine which will be used on the commercial routes is the Caproni modified war machine.—H. G. C.

PORTUGAL.

A Great Britain-Portugal Aerial Mail.

The Anglo-Portuguese Chamber of Commerce is considering a proposal for the establishment of an aerial mail service between Great Britain and Portugal.

UNITED STATES OF AMERICA.

A Vertical Descent.

On July 21st, during the third effective race in the "America" Cup contest, the United States Airship C ("Blimp" type), manned by a naval crew and carrying the correspondents of the Associated Press, the United Press and the *Evening Post* as passengers, collapsed while flying over Jamaica Bay, New York State, at a height of 1,000 ft. The airship fell into shallow water and was damaged beyond repair, though the crew and passengers were unhurt. The accident was thus robbed of its chief charm and the United States public is deprived of an unexpected joy.

The Aerial Mail Service.

The Second Assistant U.S. Postmaster General's (Mr. Praeger) report for May as to the operations of the three aerial mail services—(1) The Washington-New York, (2) the New York-Cleveland-Chicago, and (3) the Chicago-Omaha—has just been issued. On the first route, 72 per cent. of the machines started on time, 85 per cent. completed on time, only 7 per cent. had forced landings, and there were no accidents. On the first stage of the second route 51 per cent. started on time, 56 per cent. completed on time, and there were 7 per cent. forced landings, 2 per cent. of which caused damage. On the second stage 77 per cent. started on time, 65 per cent. completed on time, there were 29 per cent. forced landings, of which 10 per cent. caused damage to the aeroplanes. The third route had 78 per cent. starters on time, 82 per cent. completing on time, and 9 per cent. forced landings. During the month 54,693 miles were flown on the three routes.

True Enthusiasm.

The following letter received by one of the agents of the Curtiss Aeroplane and Motor Corporation, Garden City, Long Island, N.Y., is worthy of record. If a similar spirit were shown in Europe it would be well for the progress of aviation. The letter is addressed to the Grand Island Aero Company, Nebraska, and is signed by the Cashier of the Home State Bank, Dunning, Nebraska, and is dated June 22nd, 1920.

"This morning at 7.20 an airplane passed over our town, from where we do not know, but evidently on a westward flight.

"Now, what we want to do is to make it possible for a stopping ground here, and to do this we are willing to furnish FREE gas, oil, and lunch. We will also have the grounds all marked, provided we are notified.

"Now if there is a special kind of oil that is necessary, kindly let us know what kind it is and we will have it on hand.

"We have some very good landing grounds east of town in the fork of the rivers.

"Please let us know if it is possible to have your planes stop here for supplies, or, if your plane is not coming through here and you know of others that are, please hand this letter to the right parties so as to obtain results."

First Commercial Airship Journey.

A Goodyear "Pony" blimp was used recently to take a rush shipment of films from a company at San Diego, Cal., to Los Angeles, a distance of 138 miles, the total time for the journey being 3 hr. 11 min. The total fuel consumption worked out at nine gallons of petrol and ½ gallon of oil—a cost of approximately a penny a mile.

It is claimed that this is the first commercial trip ever made in the United States by lighter-than-air craft and the longest ever made by so small an airship.

AIRCRAFT IN PARLIAMENT

HOUSE OF COMMONS

July 19th.—The following oral answer was given :—

COMMITTEE OF IMPERIAL DEFENCE.

Major-General SEELY asked the Prime Minister whether a sub-committee of the Committee of Imperial Defence has been set up with equal representation of the land, sea and air forces with a view to the effective co-ordination of those forces?

Mr. BONAR LAW : The answer is in the affirmative.

Major-General SEELY : May I ask, then, if there is equal representation, by Ministers of equal status, of the Army, the Air and the Sea?

Mr. BONAR LAW : I suppose my hon. and gallant friend refers to the fact that the Minister for War is also the Minister for Air. That is so, but the Under Secretary for Air is also one of those on the Committee.

Lieut.-Commander KENWORTHY : Is there a Treasury representative on this Committee?

Mr. BONAR LAW : No, sir, not for this purpose.

* * *

The following written answers were given :—

MESOPOTAMIA (REBELLION, RUMEITHA).

Mr. CHURCHILL, in the course of a reply to Mr. ORMSBY-GORE, who asked for information regarding the progress of operations in Southern Mesopotamia, said : The operations of the column sent from Baghdad to relieve Rumeitha have been hampered by continual cutting of the railway by the Arabs. The garrison of Rumeitha is holding out, and has obtained supplies by aeroplane and by a raid into the town of Rumeitha, which has been effectively bombed by our aeroplanes. The Arabs are known to have suffered heavy casualties, inflicted both by troops and aeroplanes. The rebellion appears to have spread to the Shamiyah district, where one tribe at least has joined the insurgents. It has not spread beyond the Middle Euphrates area.

ROYAL AIR FORCE, HOUTON STATION, ORKNEY.

Mr. WASON asked the Secretary of State for Air if representations have been made to him with reference to the damage being done by the Royal Air Force to the road between Orphir and Kirkwall; that a lorry, nominally 3½ tons, but actually 4½ tons, runs to and from Kirkwall at a high rate of speed; and also with reference to the general waste and destruction continually going on at Houton Station, that in the huts there windows are smashed, doors left open, and material thrown about and exposed to all weather conditions, and boats that were to have been sold neglected and useless; and if the Government will have an independent inquiry made?

Mr. CHURCHILL : With regard to the first part of the question, financial assistance to the extent of £2,764 is being rendered to the highway authority of the Orkney County Council for the restoration of this road, which was unavoidably damaged by Royal Air Force traffic. Until the receipt of the letter from the Orkney County Council, which my hon. friend was good enough to forward to me, no representations had been received concerning the continuance of Royal Air Force traffic over the road.

The Royal Air Force has been responsible for considerable traffic on the roads of Orkney, but such traffic has been unavoidable. The use of lorries capable of carrying a load of 3 tons has been essential for the transportation of stores. A tender runs daily between Kirkwall and Houton for the purpose of drawing stores and rations. No complaints have been received by the commanding officer of the Station that the bye-laws of the County Council with regard to speed limits have been broken.

It is considered that the transfer of personnel from other more important duties for the purpose of repairing damage to huts and stores caused by winter gales or for providing maintenance parties would be uneconomical. The boats, to which I presume my hon. friend refers in the penultimate part of the question, were sunk during gales, and the cost of salving them would greatly exceed their commercial value. It is not considered that any useful purpose would be served by a special Government inquiry into this matter.

* * *

July 20th.—The following oral answer was given :—

ROYAL AIR FORCE (AERO ENGINES).

Viscount CURZON asked the Secretary of State for Air whether aero engines are still being manufactured for the Air Ministry; if so, how many and of what types; whether engines of a similar type are now and have been declared surplus to the Disposal Board; and, if so, why are engines still being manufactured.

Mr. CHURCHILL : The answer to the first part of the question is in the affirmative. The following engines are now on order for the Air Ministry :—

Rolls-Royce "Falcon III," 99; Napier "Lion," 50; Sunbeam "Cossack" (airship type), 11; Siddeley "Tiger," 6; 1,000-h.p. Napier, 6; Semi-Sikh Sunbeam, 4.

With regard to the third and fourth parts of the question, 18 engines of the Rolls-Royce "Falcon III" type which were damaged beyond repair have been declared surplus. A number of this type of engine, however, is still required to bring the Royal Air Force up to post-war strength. No new engines of the types now being manufactured have been handed over to the Disposal Board.

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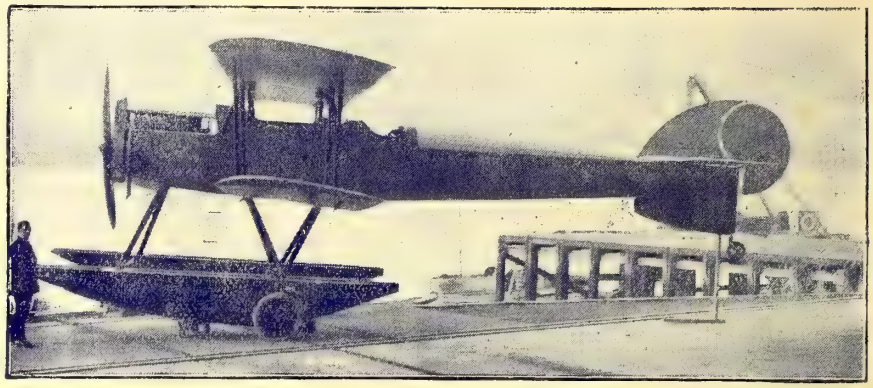

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THE AEROPLANE

WEDNESDAY, AUG 4, 1920.

Vol. XIX. No. 5. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.]

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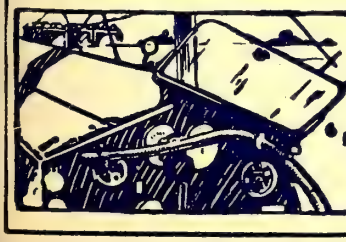
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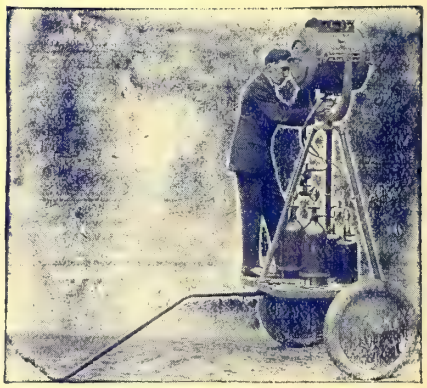

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The "Bristol" Aeroplanes

were the subject of close inspection and enthusiastic comment on the part of those who attended the recent Aero Show. The following extract from a letter in our possession is typical of the interest displayed :

"At the close of the Aero Show at Olympia, I feel I should like to write and tell you of the extraordinary interest and admiration which have been aroused by your wonderful exhibit, the 'Bristol' Triplane. No one with any interest in aviation could fail to be aroused to something like enthusiasm by so wonderful a proof of the strides recently made in the science of aviation."

To those who were unable to attend the Show we shall be glad to send illustrated details of our exhibits.

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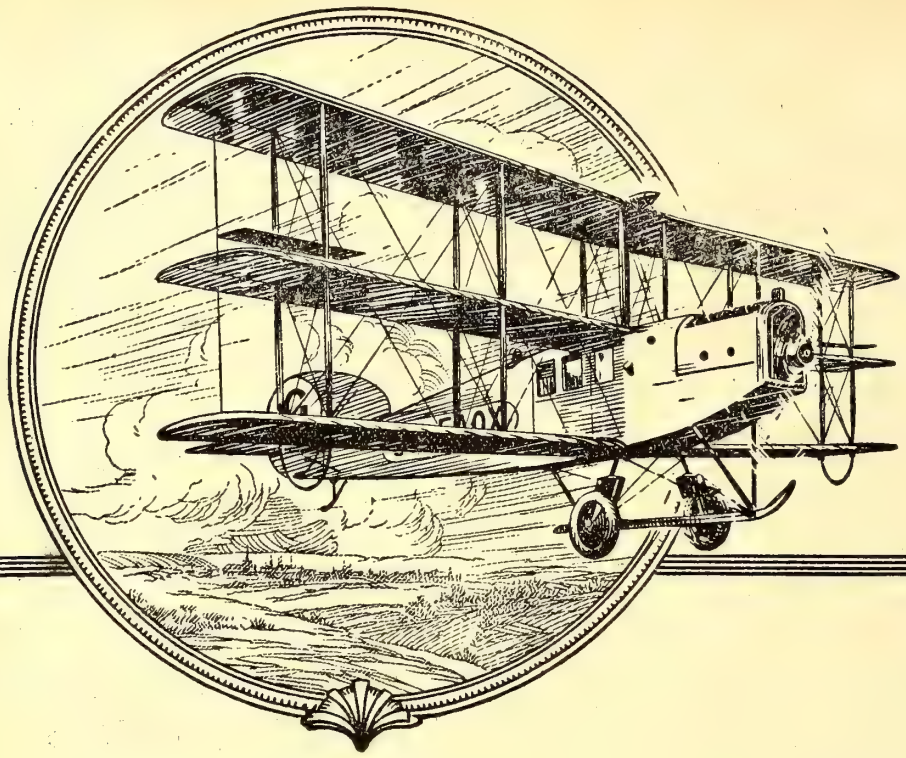

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AUG. 4, 1920.

THE AEROPLANE

VOL. XIX. No. 5.

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ON AIR POSTS.

How or why the British Business Man manages to exist passeth all understanding. His greatest ability appears to be the avoidance of education and information. Outside the narrow groove of his own particular firm he seems to have no ideas—except golf and bridge—and he seems to escape in a most wonderful way having ideas thrust upon him.

Possibly it is this one-eyed outlook on life which enables him to achieve such limited success as comes to him ultimately. If he looked outside his own little groove it might lead to a dispersal of energy. As it is he keeps plodding on, and if he does not get there in the end, he gets somewhere which he fondly imagines to be *there*.

And yet, when one gets the ordinary British Business Man quietly to oneself and begins to pump ideas into him he frequently displays almost human intelligence. It is in fact possible to make him think, and if one had time to continue the treatment it might be possible even to make him act.

All of which, though one might not think so, is strictly apropos of Air Posts.

Transportation Is Civilisation.

Obviously rapidity of communication is the greatest possible aid to business. Even the British Business Man has had that fact driven into his head. Otherwise he would not grow apoplectic over his telephone, tear up hundreds of telegraph forms a week and suffer from heart disease as the result of trying to catch trains.

And still the British Business Man has not yet realised that where foreign business is concerned the Air Post is as reliable as any other post, is as quick as a telegram, besides being very much cheaper, and is far less trouble than a telephone.

The Horrible Examples.

Some few weeks ago one was talking to a prominent Yorkshire business man, who has had quite considerable success in his own line of business. He does a fair amount of trade with France, Belgium, and Holland, but he had no idea that he could post a letter in, say, Sheffield, Leeds, or Huddersfield after lunch and have it delivered in Paris, Brussels, or Amsterdam during business hours next day.

He had heard dimly something about air posts, but he thought that they were purely experimental. Perhaps a letter sent by air got across to Paris, perhaps it did not. Anyway, such a letter was only a sort of souvenir for the kids to put in their stamp-albums.

He thought that perhaps two or three aeroplanes flew across the Channel in a week, and that the letters from people who wanted to create stamp-album souvenirs were saved up for these machines. In fact he regarded the whole thing rather as a newspaper stunt.

A few days ago one tackled a London business man, a financier of sorts, on the same subject, thinking that his Cockney wit might have been a shade quicker in appreciating the situation than the more stolid mind of the Yorkshireman. Not a bit of it. He thought that air lines existed for the amusement of rich people who took the enormous risk of flying across the Channel once so that they could talk about it for the rest of their lives. And he also thought that air posts only existed for the purpose of producing souvenirs.

The same day one tried the same questions on an advertisement expert, a Scot who has lived most of his life in London and might be supposed to combine Scottish shrewdness with Cockney quickness. But no! He was just as bad as the rest. His idea of the air post was coloured by his profession, as in the cases of the others. He thought that all the talk about air posts was just an advertising stunt got up by the aeroplane firms in the hope of inducing people to fly some day.

He was better than the others in that he felt somehow "inside himself," as he said, that people were really "going to fly some day," but it had never struck him that the air post is to-day an actual service in being which is a very present help in time of business. He, like the others, simply did not know what is being done.

Things They Did Not Know.

Here are a few of the things that these very fairly successful and quite representative business men did not know.

They did not know that they can send a letter by air post to Paris by simply putting an ordinary twopenny stamp on the envelope in addition to the regular twopenny halfpenny stamp, writing "AIR MAIL" on the top of the envelope, and posting it in an ordinary pillar-box.

They did not know that they can send a letter by air post to Brussels by the same process.

They did not know that they can send a letter by air post to Amsterdam in the same way, but with a threepenny stamp instead of a twopenny stamp for the Air Mail fee.

They did not know that a mail aeroplane leaves Croydon for Paris every morning at 09.30 and that another leaves at 16.30 (more commonly known as 4.30 p.m.).

They did not know that corresponding mail aeroplanes leave Paris every day at the same hours. In fact they did not know that there is any air post from Paris to London.

They did not know that every morning a mail aeroplane leaves Cricklewood for Brussels and another for Amsterdam, and that corresponding machines leave Brussels and Amsterdam every day for Cricklewood.

They did not know that letters can be sent by air to Brussels and Amsterdam.

They did not know that Air Ports exist at Croydon and Cricklewood.

And, being thus happily ignorant of essentials, they did not know quite a lot of other things which every business man ought to know.

Things that Astonished Them.

They were astonished when they were told that a perfectly regular aerial mail service between London

and Paris has been running for nearly a year, and between London and Brussels and London and Amsterdam for weeks.

They were amazed when they were told that for weeks and weeks past over a hundred aeroplanes and between three hundred and four hundred persons have crossed the Channel by air each week on the regular Continental Air Lines.

They were still more amazed when they were told that during the filthy weather of the past two or three weeks all the mail aeroplanes have got through, in spite of rainstorms and gales of wind.

They were almost incredulous when they were told that on several occasions the mail aeroplanes have done their journeys to schedule time when some of the cross-Channel boats have been hours late or have actually been prevented from leaving harbour.

A Case for Direct Action.

When ordinary representative British Business Men are so lamentably ignorant of what is actually being done, is it at all surprising that the Air Mail is not used as it should be by the Business Community? And is it surprising that our business with the Continent is not increasing as rapidly as it might.

One suggests to all readers of these notes, who represent, one believes, all those who are sincerely interested in the progress of aviation, that the time has come for concerted direct action on the rest of the Community. It is our duty, one and all, to see that everybody in the United Kingdom and Ireland is made to realise once and for all that the Air Mail Lines are just as regular and just as reliable as the steamship lines, and are just as much a part of our commercial organisation.

Plans of Campaign.

All readers can help in this campaign, by bringing the subject up for discussion on every possible occasion, and by impressing the facts on their business friends.

Those who are more keen or more energetic can help still further by sending copies of this article to the editors of their local papers. One feels sure that many editors are unaware of the scale on which our air lines are working to-day, and will be glad to enlighten their readers, especially in the great business centres, on the subject of recent developments in commercial aviation.

Further, one suggests that the Air League might well include in its schemes for propagating the Gospel of Aviation the constant enlightenment of the Public on the business possibilities of aerial posts, both for letters and parcels, and on new developments as new lines are opened or extensions are made to existing lines.

Also, one suggests that the Society of British Aircraft Constructors should concentrate all the energy it possesses on a regular campaign to impress on the Business Community, by way of the Press and by way of similar Trade Associations, the fact that business can be helped very materially by means of the aerial mail services. The whole future of the Aircraft Industry depends on orders for public service vehicles, such as passenger, parcel, and mail machines.

The market for privately owned machines is practically negligible. The market for war machines will not be worth much till the Great War of 1935, or thereabouts, begins. Therefore the hope of the Industry is in the Air Lines, and the best way to help to develop the Air Lines is to teach people to use the aerial mail services.

Things Every Business Man Should Know.

There are dozens of facts which, if they can be hammered into the heads of our British Business Men, will result in an enormous increase in the volume of air traffic between this country and the Continent. Here are just a few of them condensed from the Official Notices on page 285:—

If you post a letter to Paris (bearing the extra 2d. stamp and marked "AIR MAIL") anywhere in the London District before the last night collection, it leaves Croydon by the 09.30 mail machine next morning and is delivered in Paris that afternoon or evening.

If, in addition, you put on it another 6d. stamp and mark it "AIR MAIL EXPRESS" it will be delivered in Paris before 15.00 hours (commonly called 3 p.m.), so that if your correspondent is in a hurry he can send the reply at once. The reply will then leave Paris by the 16.30 (4.30 p.m.) mail machine and will be delivered to you in London the same night.

If a business man in the Provinces posts a letter to Paris (with the extra 2d. stamp and marked "AIR MAIL") in time for the afternoon or evening mail to London, it will go by the 09.30 mail machine next morning, will be delivered in Paris that afternoon, and if it is in time to catch the 16.30 return mail, he will receive the reply in the Provinces the following morning.

In a case of great haste you can post a letter at 08.00 hours at the Central District Post Offices, have it sent by the 09.30 mail machine, have it delivered by express messenger in Paris soon after midday, have the reply dispatched by the 16.30 mail machine from Paris and have it delivered to you in London by express messenger before 21.00 hours (9 p.m.). And all for a total extra cost of one shilling (for two express deliveries) and fourpence (for two Air Mail fees) over and above the normal fivepence (for the two ordinary postal fees).

That is to say, two long letters (the original communication and the reply) can be passed between London and Paris in about twelve hours, for a total cost of one shilling and ninepence. Which is not only pounds cheaper than the cost of telegrams containing the same number of words, but actually quicker.

Dutch and Belgian Business.

If you want to communicate with Brussels or Amsterdam the saving in time is even greater, for the flying time between London and Brussels or between London and Amsterdam is very little longer than the time between London and Paris, whereas the ordinary post by rail and boat takes much longer than it does between London and Paris.

Thus it takes at least 24 hours for a letter to go in the ordinary way from London to Amsterdam. In fact a letter has to be posted early in the afternoon in London to reach Amsterdam late the following evening, so the Amsterdam business man does not receive it till the next morning.

If it is sent by Air Post it can be posted in London late at night with the ordinary office letters, and it will be delivered in Amsterdam early the following afternoon.

By using the Air Post one can save just as much time in the delivery of letters to the Provinces of Holland or Belgium as if they are sent to addresses in the Capitals themselves. Thus letters sent by Air Post to Liège, Charleroi, Haarlem, and such cities are delivered 12 hours or more sooner than if they go in the ordinary way. And all for an extra 2d. or 3d stamp.

Moreover, by the time these Notes appear, the Air Mail machines between London and Amsterdam will probably be alighting at Rotterdam to deliver letters on the way North and to pick up letters on the way South. This will mean a saving of over 12 hours on Rotterdam letters, and there is a very large amount of business between England and Rotterdam.

One could go on for hours pointing out the advantages to all British Business Men of using the Air Post in all communications with France, Belgium, and Holland, but lack of space prohibits further discussion. It is, however, necessary to draw attention to the fact that letters posted late for Spain, Portugal, Italy, and Switzerland, if sent by Air Post to Paris pick up many hours over letters sent in the ordinary way.

The Regular Use of the Air Post.

It is evident, therefore, that any wise business man, when once he has appreciated the fact that the aerial mail service is a thing in being, will send all his Continental letters by Air Post. The hours saved in this way will show him a very fine profit over the few pence spent on the extra postage.

Any business man will pay a couple of shillings for a taxi to save himself a quarter of an hour in getting about London, or any other big business centre. Surely then it is worth while to spend 2d. or 3d. on an important business letter to save 12 hours or more in delivery.

All that is necessary is to give instructions to the "Outer Office" to mark all Continental letters "AIR POST" and to put on each an extra 2d. stamp for France or Belgium, or an extra 3d. stamp for Holland. It is all so simple. And it will save such a lot of time for so little money.—C. G. G.

ON THE ATTACK ON THE AIR MINISTRY.

It is with great regret that one sees that eminently respectable journal the *Morning Post* being made the tool of agitators against the Air Ministry. Apparently it has been informed that certain officers with war service have been demobilised while officers and/or officials without war service are retained in office at the Air Ministry itself. It seems extremely likely that such is the case, in view of the fact that out of the 30,000 or so officers of the Royal Air Force an extraordinarily minute percentage showed any capability for administrative work, and that at the moment the great need of the R.A.F. is for first-class administrators.

One of the *Morning Post's* grievances seems to be that a Naval officer with war and technical experience is among the discharged. If only one such has been discharged then the Air Council is being very lenient indeed. One could name several such who could certainly have left the R.A.F. during the war with advantage to the Force, even if they had had to be replaced by Conscientious Objectors.

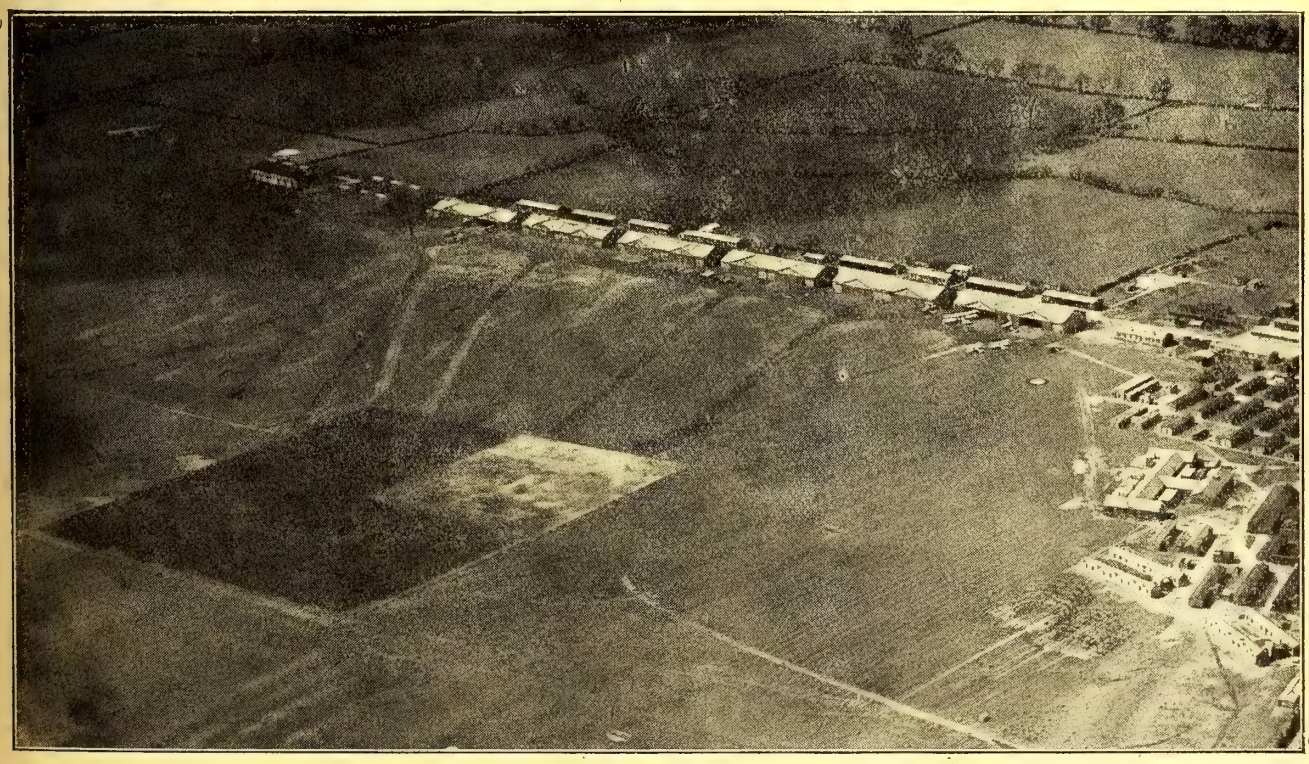
On general principles one is naturally in favour of giving the best permanent berths to people who have served the King. For which reason every member of one's own staff is an ex-officer of the R.A.F. or the Army. In order to be logical in its present agitation, the *Morning Post* ought to be able to say as much. But one believes that at least one of its most brilliant writers during the war was a comparatively young and quite fit man, who, so far as one knows, is still contributing to that excellent paper.

But where a specific job has to be done in peace time one cannot let sentiment interfere with efficiency. If the best man to organise or administrate a department of the Air Ministry so that it may deal efficiently with the problems of the next war happens to be a civilian, or an officer who has seen no active service, then it is the duty of the Air Council to retain such an official.

All who were acquainted with the War Office during the war know that there were first-class men there eating their hearts out to go on active service and forbidden to go because they were too valuable at home. According to the *Morning Post's* line of argument these men should now be dismissed in order to make room for men with war experience, ignoring the fact that the same war experience has probably unfitted the latter entirely for Staff work until they have been through a long and arduous course at the Staff College.

One is entirely ignorant as to the identity of any of the persons to whom the *Morning Post* refers, either as victims or as allegedly unworthy holders of office, but one has enough confidence in the Air Council, as now constituted, to be prepared to back the choice of the Authorities in this matter.

Fortunately the entire *personnel* of the R.A.F. of today is animated by a fine spirit of loyalty to its chiefs and is not likely to be disturbed by this latest agitation. Nevertheless it is entirely lamentable that anything should be said or written which might even tend to diminish the *esprit de corps* of the younger members of the R.A.F. just when it is becoming a very worthy section of the King's Services.—C. G. G.



NORTHOLT AERODROME, now the property of the Central Aircraft Co., photographed by Mr. Joseph Edge from a Central Aircraft Company aeroplane. That well-known landmark, the Kennedy Giant Aeroplane, will be recognised by all who have been to Northolt during or since the last war. The cinder patch and cinder paths can be seen, and several C.A.C. machines are seen standing outside the sheds. The buildings on the right are the old R.F.C. living quarters and offices.

A VERY GREAT PERFORMANCE.

On August 2nd, Messrs. Parer and Macintosh, two ex-officers of the Australian Flying Corps, arrived from London (they left Hounslow on Jan. 8th last) at Port Darwin, Australia, on a standard D.H.9 biplane with a Siddeley "Puma" engine. Thus they completed one of the greatest performances in the history of aviation.

The quality of their performance may be judged by a story told of them by an R.A.F. officer who left Egypt shortly after they arrived there. The pair of adventurers drifted casually into the aerodrome at Heliopolis, having flown direct from Crete, and calmly announced that they were on their way to Australia. They had no spares or tools worth mentioning with them, not even, according to the teller of the story, so much as a "King Dick" spanner to change a sparking plug.

There happened to be at Heliopolis a technical serjeant R.A.F., who was a specialist on "Puma" engines. He, in the goodness of his heart, gave their engine a thorough "top overhaul," but did not take it all to pieces. Having done so, he informed them that the engine was "good enough for anything."

Thereupon, the cheerful pair, taking his word for it, pushed straight off on a compass course for Baghdad, direct across the Arabian Desert, instead of following the usual route by way of Damascus. Fortune favours the brave, and they duly made a non-stop run to Baghdad. For their safety they may thank their engine and that excellent R.A.F. serjeant, for a descent almost anywhere on the way would have meant death in the desert, either from thirst and starvation or at the hands of hostile Arabs.

One believes that theirs is the only flight on record direct from Egypt to Mesopotamia, and it is a performance of which not only the adventurers themselves but the makers of the "Puma" engine may well be proud.

After Baghdad they progressed somewhat irregularly, crashing and repairing at intervals owing to lack of aerodromes, wiping off undercarriages, breaking airscrews in landing, but always somehow patching up and proceeding.

They were not out for any prize, for they left England long after all the competitors for the Australian Government prize. They were merely going home to Australia by air. And they have duly arrived, thanks, not to expensive organisation, but to their own pluck and enterprise, and to the flying quality of Captain de Havilland's No. 9 design and to the reliability of the Siddeley "Puma" engine.

It was a very great performance indeed, and one hopes that before long it will be possible to obtain from Australia a detailed log of their journey, showing precisely what mishaps occurred to them and how they carried out their repairs on the way. Such a journey, undertaken purely as a sporting tour, is actually of greater interest than a big flight backed by elaborate organisation.

An idea of the immense determination of the pair may be gathered from the fact that a bottle of whisky which left England with them reached Australia intact. It may be, however, that this is only evidence of the good fortune which attended them in their landing places.

On behalf of all concerned with British aviation one offers to Messrs. Parer and Macintosh very sincere congratulations on having achieved one of the finest and most sportsmanlike performances in the history of aviation.—C. G. G.

THE AIR MINISTRY COMPETITIONS.

On August 3rd the first part of the Government Competitions, that for the large and small aeroplanes, was due to start at Martlesham Heath Experimental Station, near Ipswich. Competing machines were allowed to arrive on July 31st, but in any case had to be at the aerodrome on August 3rd.

The entries for the competition were as follows:—

Large Aeroplanes.—Aircraft Manufacturing Co., Ltd., Central Aircraft Co., Handley Page, Ltd., and Vickers, Ltd.

Small Aeroplanes.—Austin Motor Co., Ltd., William Beardmore and Co., Ltd., Bristol Aeroplane Co., Ltd., Westland Aircraft Works (Branch of Petters, Ltd.), A. V. Roe, Ltd., and the Sopwith Aviation and Engineering Co., Ltd.

One gathers that the Aircraft Manufacturing Co., Ltd., have scratched their entry.

Both large and small aeroplane classes will be tested concurrently.

The small class includes aeroplanes carrying from one to seven passengers; the large class includes aeroplanes carrying more than seven passengers exclusive of pilot.

The general order wherein it is proposed to carry on the trials is as follows:—(i) General examination and weighing; (ii) High and low speed tests; (iii) Self-controlled flight (5 min. test with hands off); (iv) Flight with one engine stopped (multiple-engined machines only); (v) Reliability and economy test; (vi) gliding test; (vii) Wind test (standing unattended in a wind on the aerodrome); (viii) Landing and getting off tests (over row of balloons tethered at 50 ft.); (ix) Landing and getting off with one engine off (for multiple-engined machines).

The similar tests on amphibian machines will take place during September and will generally follow a similar outline with the addition of the tests on the water which will be made at Felixstowe.

The date for the second half of the competition, that for seaplanes (amphibians), is Sept. 1st, for which the following entries have been received:—William Beardmore and Co., Ltd., Fairey Aviation Co., Ltd., S. E. Saunders, Ltd., Supermarine Aviation Works, Ltd., and Vickers, Ltd.

It will be remembered that these competitions are for prizes totalling £64,000 which have been offered by the Air Ministry to encourage the design of commercial aircraft combining the qualities of safety, reliability and comfort.

THE AVRO INJUNCTION.

In the Chancery Division of the Law Courts, before Mr. Justice Paterson, on July 29th, A. V. Roe and Co., Ltd., sought the continuance of an interim injunction restraining the Aircraft Disposal Company, Ltd., from selling or offering for sale any aeroplanes or other goods not of plaintiffs' manufacture, as Avro goods.

Mr. Douglas Hogg, for plaintiffs, said that during the war the designs and patents of the Avro 504K biplane—a very successful machine—were lent to the Government that other manufacturers might produce machines of this type as plaintiffs were unable to satisfy the demand. Many of these machines were in Government stock after the war and the Ministry of Munitions in June, 1919, agreed to sell them as "of Avro type" with a note that they were manufactured by another firm. The Aircraft Disposal Company, Ltd., purchased the surplus stock of Government aeroplanes and were claiming to sell as "Avro" machines and not as "of Avro type." Plaintiffs did not object to sales qualified by the words "of Avro type."

Evidence was read on both sides and Mr. J. Whitehead addressed the court for the defendants.

Mr. Justice Peterson continued the interim injunction.

THE ROYAL AIR FORCE MEMORIAL FUND.

Particulars of the first series of donations to the Royal Air Force Memorial Fund have been issued during the past week. It is hoped that it will be possible to raise a total sum of £400,000, which is the least amount with which it would be possible to carry out the various schemes drafted by the Committee. The total subscriptions recorded on July 20th amount to £90,166 18s. 5d.

Among the subscriptions received is one from the Air Ministry (sum received from the R.A.F. Institute profits) of £50,000. Other subscriptions of particular interest are those of the R.A.F. Aerial Pageant at Hendon (first instalment), £6,500; the R.A.F. Hospitals Committee, £23,000; General H.M. the King of Spain, K.G., £5; H.R.H. the Duke of York, K.G., £30; the Marquess of Londonderry, £500; Messrs. Cox and Co., £500; the Lord Weir of Eastwood, £1,000. It is clearly impossible in the restricted space available to give a list of all subscribers, of which there are several hundreds.

Those readers of this news-sheet who have not yet forgotten the services rendered to the country by the Flying Services during the past years are asked to send subscriptions, small or large, according to the financial standing of the giver, to the Secretary of the Fund at No. 7, Iddesleigh House, Caxton Street, Westminster, S.W.1.

LIGHT RELIEF.

Officers and men late of the R.A.F. and R.F.C. will be hugely amused by a little book entitled "R.A.F. Ravings," alphabetically arranged by Mr. Charles Paysant, late R.F.C., who, one believes, was badly crashed while in that Force.

Mr. Paysant is a humorous artist of considerable ability, and his book consists of a series of alphabetical rhymes of the R.A.F. with a distinct R.F.C. flavour, accompanied by illustrations by Mr. Paysant himself. His caricatures are such as to entitle him to a high place among the humorists of the illustrated Press, for he manages to obtain his effects with almost as few lines as the late Phil May, and his caricatures are only just sufficiently exaggerated to make the necessary difference between a life-like portrait and a caricature. The picture of the Medical Board is simply wonderful. So is "The expression our flying men wear." "The instructor, oh pity him please," is another gem.

With paper and printing at its present price the book is cheap at 1s. 9d., and it has a very distinct historical value in that it records pitilessly the weaknesses and foolishnesses of the R.A.F. before the present efficient reformation began. When the infant of the future wants to know "What Daddy did in the Great War," Daddy will find the book a useful reminder. "R.A.F. Ravings" can be obtained from the Aeroplane and General Publishing Co., 61, Carey Street, W.C.2.

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OFFICIAL NOTICES.

AIR MAIL SERVICE BETWEEN ENGLAND AND HOLLAND.

The Postmaster-General announced that, beginning on Monday, July 5th, there would be a daily dispatch of mails by aeroplane (Sundays excepted) between London and Amsterdam, leaving the respective aerodromes at about 4 p.m. and arriving at the respective terminal Post Offices at about 7.30 p.m.

The Air Mail fee has been fixed at the low rate of 3*d. per oz.*, and unrestricted facilities for posting will be afforded. (The special arrangements relating to letters for the London-Paris Air Mail Service remain in force for the present. An early and substantial reduction of the fee for the Paris service is in contemplation.)

Express Air Mail packets for Amsterdam and Rotterdam should normally be delivered the same evening, and on-express Air Mail packets for these places and for the rest of Holland by first post on the following morning. As letters sent by the ordinary night mail from London are not delivered anywhere in Holland until the following afternoon or evening, the Air Mail will normally be quicker by, at any rate, the greater part of a business day; and by use of the Air Mail in both directions it will be possible for a business house in the City or West End of London to obtain a reply from Amsterdam within about thirty hours.

Air Mail letters from Holland will normally be delivered in many of the large provincial towns by first post on the morning after dispatch from Amsterdam

Every class of correspondence, registered and unregistered, except parcels and insured packets may be sent. Packets will be accepted for ordinary as well as for express delivery They may be posted, if intended for registration, at any Post Office, or, if unregistered, in any public posting box

Every Air Mail packet must be *prominently marked* in the top left-hand corner of the cover with the words "AIR MAIL," or, if express delivery is desired, "AIR MAIL EXPRESS."

The fees shown below must be prepaid by means of postage stamps affixed to the cover in the ordinary way :—

(1) Ordinary foreign postage, and registration fee (where payable);
(2) An Air Mail fee of 3d. *per oz.*;
(3) An express fee of 6d. *per packet* when express delivery is required

The latest times of posting will be as follows :—

In the Provinces up to the latest time of posting for transmission by the last night mail to London; but in some cases connection by day mail to London will be obtainable. Precise information can be obtained from the local Head Post Office.

Office or District	In London. Registered (if handed in)	Unregistered (if handed in)	Unregistered (if posted in Public Letter Boxes)
General Post Office	2.55 p.m.	3.0 p.m.	1.30 p.m.
Threadneedle Street, B.O.	2.40 p.m.	2.45 p.m.	E.C. District — 12 noon at larger Branch Offices, 11.45 a.m elsewhere.
Lombard Street, B.O.	2.40 p.m.	2.45 p.m.	
Parliament Street, B.O.	2.40 p.m.	2.45 p.m.	11.0 a.m.
Charing Cross, B.O.	2.45 p.m.	2.50 p.m.	10.30 a.m.
W.C.D.O.	3.5 p.m.	3.10 p.m	12 noon.
W.D.O.	3.10 p.m.	3.15 p.m.	12 noon.
S.W.D.O.	2.35 p.m.	2.40 p.m.	12 noon.
Rest of London—			
District Head Offices	—	—	About 12 noon (except Paddington, 11 30 a.m.).
Sub-Districts	—	—	About 8.30 a.m.

AIR MAIL SERVICE BETWEEN ENGLAND AND BELGIUM.

The Postmaster-General announced that, beginning on Monday, the 19th of July, there would be a dispatch of mail by aeroplane between London and Brussels every week-day. For the present the outward mail will be despatched from the Cricklewood Aerodrome at about 2.30 p.m., and will be due at the Brussels Post Office at about 5.30 p.m. In the homeward direction a mail will be despatched every week-day, leaving Brussels at 10 a.m., and reaching the London Post Office about 1.30 p.m.

The Air Mail fee has been fixed at the low rate of 2d. *per oz.*, and there will be unrestricted facilities for posting.

Correspondence for Brussels posted in London should normally be delivered on the same evening without express delivery, and correspondence for other places in Belgium by first post on the following morning. Thus a letter for Brussels sent by the Air Service will be delivered at least 12 hours earlier than if it were sent by the ordinary afternoon mail from London, and a letter for a place in Belgium some distance from Brussels, which would not reach Brussels by the ordinary service in time to fall into the onward night mails from Brussels, will be appreciably accelerated by use of the Air Service. By the use of the afternoon Air Mail Service from London and the morning Air Mail Service from Brussels it will be possible for a correspondent in London to obtain a reply from Brussels in about 24 hours. Moreover, the Service will be available for the transmission by air as far as Brussels of correspondence addressed to Germany and countries beyond, which will normally be accelerated by 24 hours. Letters addressed to Cologne will be delivered by first post on the morning after despatch from London.

Letters from the Provinces posted overnight for despatch by Air Mail to Brussels on the following afternoon will normally be delivered in Brussels in the evening, whereas if sent by the ordinary Mail Service they would not be delivered until the morning after despatch from London. It will not, however, be possible, except in a few cases, to post letters in the Provinces in business hours in time for despatch on the same day by Air Mail to Brussels.

Correspondence sent from Brussels by the morning Air Mail will normally be delivered in London on the same afternoon, and in the Provinces on the same evening or the following morning

Every class of correspondence, registered and unregistered, except parcels and insured packets, may be sent. Packets will be accepted for ordinary as well as for express delivery. They may be posted if intended for registration, at any Post Office, or, if unregistered, in any public posting bax.

Every air mail packet must be *prominently marked* in the top left-hand corner of the cover with the words "AIR MAIL," or, if express delivery is desired, "AIR MAIL EXPRESS."

The fees shown below must be prepaid by means of postage stamps affixed to the cover in the ordinary way :—

(1) Ordinary foreign postage, and registration fee (where payable);
(2) An Air Mail fee of 2d. *per oz.*;
(3) An express fee of 6d. *per packet* when express delivery is required.

The latest time of posting will be as follows :—

IN THE PROVINCES.

Up to the latest time of posting for transmission by the last night mail to London. Precise information can be obtained from the local Head Post Office.

Office	In London. Registered (if handed in)	Unregistered (if handed in)	Unregistered (if posted in Public Letter Boxes)
General Post Office	1.25 p.m.	1.30 p.m.	12 noon
Threadneedle Street B.O.	1.10 p.m.	1.15 p.m	E.C. Dist.: 11.0 a.m. at larger Branch Offices, 10.0 a.m. elsewhere
Lombard Street B.O.	1.10 p.m.	1.15 p.m	
Parliament Street B.O.	1.10 p.m.	1.15 p.m.	10.0 a.m.
Charing Cross B.O.	1.15 p.m.	1.20 p.m.	10 30 a.m.
W.C.D.O.	1.35 p.m.	1.40 p.m.	11 0 a.m.
W.D.O.	1.40 p.m.	1.45 p.m.	11.0 a.m.
S.W.D.O.	1.5 p.m.	1.10 p.m.	11.0 a.m.
REST OF LONDON—			
District Head Offices	10.45 a.m.	—	11.0 a.m.
Sub-Districts	about 8.15 a.m.	—	about 8.30 a.m.

Arrangements are being made for a considerable reduction of the special air fee in the Air Mail Service from London to Paris, and an announcement on this subject will be made shortly.

LONDON—PARIS AIR MAIL.—REDUCTION OF AERIAL FEE.

The Postmaster-General announced that on and from Thursday, the 22nd of July, the special fee charged in addition to the ordinary foreign postage on correspondence sent from this country to Paris by Air Mail will be reduced from 2s. to 2d. per oz. The fee of 6d. per packet will continue to be charged on correspondence intended for express delivery

NOTICE TO AIRMEN (No. 82).

AIR MINISTRY, July 30th.

It is hereby notified :—

Pilots are warned that a fixed balloon will be flown on Monday, August 2nd, 1920, from the grounds of the Crystal Palace, 5 miles N.N.E from Croydon Aerodrome.

By Command of the Air Council,
(Signed) W. F. NICHOLSON.

NOTICE TO AIRMEN (No. 83).

AIR MINISTRY, July 31st.

It is hereby notified :—

The Coastal and General Air Charts prepared by the Admiralty during the war for the use of R.A.F. Pilots have now been placed on sale to the public at One Shilling and Sixpence per sheet. The index sheets to the series are priced at one shilling.

The Coastal Air Charts cover the coasts of Great Britain and Ireland on the scale of one inch to three nautical miles (Air Chart Index A), and the Southern and Eastern shores of the North Sea from Ostend to Blaavand Pt (in Denmark), and the Cattegat, on the scale of one inch to five nautical miles (Air Chart Index B)

The General Air Charts cover a slightly larger area and range in scale from one inch to 10 nautical miles to one inch to 30 nautical miles (Air Chart Index P).

These Air Charts, which are constructed on Mercator's projection measure approximately 20 in. by 18 in. They show lights and fog signals, buoys and beacons, sites of wrecks, and the direction of the flood and ebb streams; soundings are given in fathoms; conspicuous objects on land are also shown for navigational purposes.

The signs and abbreviations used on Air Charts are contained in Air Chart Index Z.

The Agent for the sale of these Air Charts and Index Sheets is Mr. J D. Potter, 145, Minories, E.1.

NOTICE TO AIRMEN (No. 81).

AIR MINISTRY, July 22nd.

It is hereby notified :—

Aerodromes and landing grounds open to civil aviation in the United Kingdom and the location of Service and Civil Stations which are available to civil aircraft in case of emergency only are shown in the following lists (A to C), which have been corrected to July 1st, 1920, and which cancel all previous lists.

The lists are classified as follows, each aerodrome or landing ground being given in alphabetical order :—

List A.—Government-owned aerodromes available for civil flying and at which accommodation exists.
(a) Civil aerodromes.
(b) Service stations.

List B.—Aerodromes available for civil machines in emergency only.
(a) Permanent Service stations.
(b) Stations temporarily retained for Service purposes.
(c) Civil stations.

List C.—Licensed Civil aerodromes.
(a) Civil aerodromes licensed for all types, the licences of which were still in force on July 1st, 1920.
(b) Civil aerodromes, the licences of which were still in force on July 1st, 1920, and which are licensed as "Suitable for Avro 504K and similar types of aircraft only." Except in very few instances accommodation does not exist. The licences have also been issued for limited periods only. Foreshore aerodromes are not included.

It should be clearly understood that these lists are purely provisional and are subject to alteration from time to time Such amendments are published fortnightly as "Notices to Airmen."

In those cases in which it is stated that accommodation does not exist, no facilities other than the actual landing-grounds are available.

No guarantee can be given at the present time that personnel to handle aircraft is available either at the Service Stations or at the civil licensed aerodromes

LIST A.

GOVERNMENT-OWNED AERODROMES AVAILABLE FOR CIVIL FLYING AND AT WHICH ACCOMMODATION EXISTS.

(A) CIVIL AERODROMES.

Aerodrome or Seaplank Station. Name.	Lat. deg.	Lat. m.	Lat. s.	Long. deg.	Long. m.	Long. s.	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name.	Dist. from Aerod'e miles	True bearing from Aerod'e
*Croydon (Waddon)	51	21	30N	0	7	30W	230	East Croydon (L.B. & S.C.R. and S.E. & C.R.) 2 miles Waddon (L.B. & S.C.R.) ½ mile	Croydon	2½	N.E.
Lympne	51	4	30N	1	1	30E	327	Westenhangar (S.E. & C.R.) 1½ miles	Hythe Folkestone	3½ 9	E. by S E.
* London Terminal Aerodrome.											
(B) SERVICE STATIONS.											
Coal Aston	53	20	0N	1	28	30W	600	Beauchief (M.R.) 2 miles Sheffield (G.C.R. and M.R.) 4 miles	Sheffield	3	N.
Felixstowe (S)	51	57	0N	1	19	0E	—	Felixstowe (G.E.R.) 2 miles	Felixstowe	2	N.E.
Northolt	51	33	20N	0	24	30W	130	Northolt Junction (G.W.R. & G.C.R.) ½ ml Ruislip (Met. and District) 1½ mile	Uxbridge Harrow	4 5	W. N.W.

(S) Seaplane Station.

LIST B.

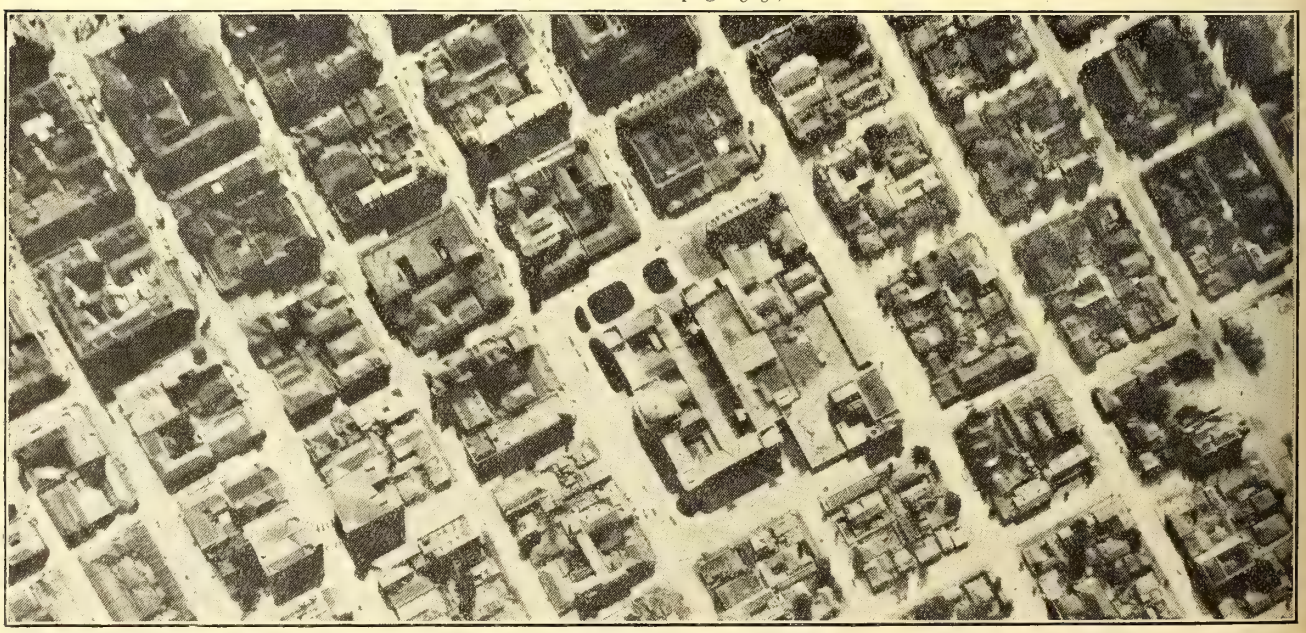
AERODROMES AVAILABLE FOR CIVIL MACHINES IN EMERGENCY ONLY.

(A) PERMANENT SERVICE STATIONS.

Aerodrome or Seaplane Station. Name.	Lat. deg.	Lat. m.	Lat. s	Long deg.	Long m	Long s	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name.	Dist. from Aerod'e miles	True bearing from Aerod'e
Andover	51	12	5N	1	31	0W	250	Andover Junction (L. & S.W.R.) 1¼ mile	Andover	1½	E.
Baldonnel	53	18	10N	6	26	30W	304	Lucan (G.S. & W.R.) 2½ miles	Dublin	10	E.N.E.
Biggin Hill	51	19	30N	0	2	0E	570	North or South Bromley (S.E. & C.R.) 7 miles (for passengers)	Westerham Bromley	6½ 5½	N. S.
Bircham Newton	52	52	0N	0	39	0E	160	Docking (G.E.R.) 3 miles	Hunstanton King's Lynn	9 18	N.W. S.W.
Calshot (S)	50	49	0N	1	19	0W	—	Brockenhurst (L. & S.W.R.) 12 miles	Southampton	15	N.W.
Cattewater (S)	50	21	30N	4	7	30W	—	Turnchapel (L. & S.W.R.) ¾ miles	Plymouth By water	6 ½	N.W.
Cranwell	53	2	0N	0	30	0W	200	Sleaford (G.N.R. & G.E.R.) 4 miles	Sleaford Grantham Lincoln	4 10 14	S.E. S.W. N
Donibristle	56	2	0N	3	21	0W	120	Inverkeithing (N.B.R.) 2 miles	Dunfermline Royston	5 7	N.W W.S.W
Duxford	52	5	30N	0	8	0E	48	Whittlesford (G.E.R.) 2¼ miles	Cambridge	8	N.
Eastchurch and Leysdown	51	23	0N	0	51	0E	24	Queenborough (S.E. & C.R.) 5 miles. Connected by the Sheppey Light Railway with the Aerodrome	Sheerness	6½	W.
Farnborough	51	16	50N	0	45	40W	225	Farnborough (L. & S.W.R.) 1 mile	Farnborough Aldershot	Adjoining 2	E S.
Fermoy	52	8	0N	8	17	0W	200	Fermoy (G.S. and W.R.) ¼ mile	Fermoy	½	S.
Frieston	52	56	45N	0	4	0E	10	Boston (G.N.R.) 5 miles	Boston	5	N.W.
Gosport	50	48	0N	1	10	0W	25	Fort Blockhouse (L. & S.W.R.) adjoining	Gosport	½	E.
Grain (A and S)	51	26	15N	0	43	0E	—	Port Victoria (S.E. & C.R.) adjoining	Sheerness (by water) Chatham Rochester	2 12½ 11½	E. S.W. S.W.
Halton	51	46	30N	0	44	30W	375	Wendover (G.C.R.) 2 miles	Aylesbury	4½	N.W.
Hawkinge	51	7	0N	1	10	0E	600	Folkestone General (S.E. & C.R.) 3 mls	Folkestone	3	S.S.E.
Henlow	52	1	0N	0	18	0W	150	Henlow (M.R.) adjoining	Hitchin Biggleswade Bedford	5 6 12	S.S.E. N.N.E. N.W.
Houton Bay (S)	58	55	0N	3	11	0W	—	Thurso Highland Rly., Scotland) by boat 36 miles	Kirkwall, Orkneys	9	N.E.
Howden (A)	53	47	0N	0	52	0W	18	Howden (N.E.R.) 1½ miles Howden (Hull & Barnsley Branch) 1½ mls	Goole Selby York	7 11 21	S.S.W. W. N.W.
Kenley	51	15	10N	0	5	30W	550	Upper Warlingham (L.B.&S.C.R.) 1 mile Whyteleafe (S.E. & C.R.) ¾ mile	Caterham Croydon	2 4½	S.S.E. N.

(A) Airships. (S) Seaplanes.

(*Continued on page* 305.)



JOHANNESBURG: showing the Law Courts in the middle. The uninteresting mathematical nature of the town-planning is very apparent.

ROLLS-ROYCE

THE 1920 MODEL.

After a trial run, a representative of the "MOTOR OWNER" writes as follows:—

"ROLLS-ROYCING" IS MOTORING AT ITS BEST WITH JUST A TINCTURE OF THE ZEST OF FLIGHT. IT IS A NEW EXPERIENCE FOR THE TIME HARDENED MOTORIST WHO HAS NOT "ROLLS-ROYCED" BEFORE AND ONE THAT HE POSITIVELY MUST NOT MISS.

"MOTOR OWNER"——————————June, 1920.

The following firms, who purchase direct from us, have sole selling rights of our cars in their respective districts.

Leicestershire, Derbyshire, Notts., Lincs., Staffs., Worcestershire, Warwickshire, Northants. and Rutlandshire: The Midland Counties Motor Garage Co., Ltd., Granby Street, Leicester. Manchester and District, including East Lancs. (as far north as a line drawn on the map due east from Cockerham) and East Cheshire: Joseph Cockshoot & Co, Ltd., New Bridge Street, Manchester.

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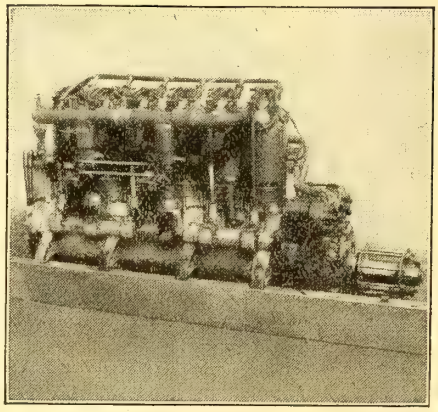
Major Gran, the Anglo-Norwegian explorer, recently flew from London to Christiania, a distance of 750 miles, in nine hours on an Armstrong Whitworth FK 8 (ex Government). He intends to make a European circuit. The machine is fitted with standard

BEARDMORE 160 h.p. Engine



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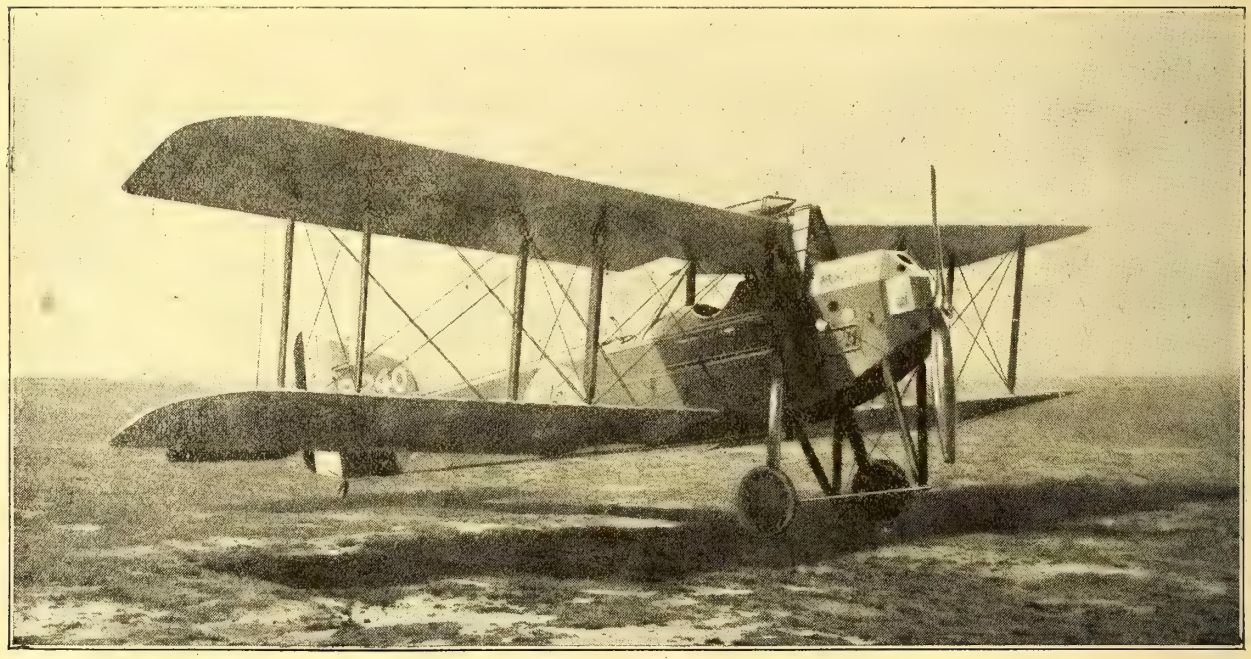

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THE WEEKLY COMMENTARY.

In an article below Captain Sayers again reverts to his favourite subject of the value of high-lift wings for commercial purposes. The immediate occasion of his present restatement is the announcement made at the end of the Aero Show, of the "Alula" wing, and this is hailed as the justification of those who believed that, by suitable formation of the wing and by the avoidance of wing end losses, high-lift wings could be cured of their more objectionable characteristics.

The recent activities of a number of experimenters have at least sufficed to show that the R.A.F.15 type of wing is not, after all, quite so certainly the ultimately best type conceivable, and there seems to be every prospect that very great advances in wing design will occur in the near future.

Mr. Leonard Bridgman contributes a series of very interesting sketches of the aeroplanes of the late Olympia Show.

The Austrian type of aero engine known by the trade name of "Hiero" is briefly described by Mr. Hildesheim in this number. This engine had an excellent reputation for reliability, and possesses several interesting features.

ANOTHER NEW WING.

By CAPT. W. H. SAYERS.

But a few years ago it was the effort of all aeroplane designers to discover a wing form capable of giving a high specific lift. It was the discovery, due to Horatio Phillips originally, that a cambered wing gave an appreciably higher lift than did a flat surface which really paved the way to the successful achievement of aerodynamic flight.

The low power available from the engines of pre-War days implied that flight—if it was to occur at all—must occur at low speeds and on a light machine, which meant a high-lift wing. This because low speed on a low-lift wing means big and heavy wings and a big and heavy machine.

Early High-Lift Wings.

In the period between 1909 and 1912—the period of the 50-h.p. engine—the type XI Blériot was without question the most uniformly successful aeroplane in existence, and the whole secret of its success lay in the fact that by using what was, for those times, a high-lift wing M. Blériot was enabled to build a small, compact and light machine, capable of flying at a reasonably low speed and therefore demanding a low minimum h.p. for its bare sustentation. It had thus a reasonable power margin in hand, was capable of a quite respectable climb, and owned a sufficient speed range to make even quite advanced "stunting" safe thereon.

With the advent of war the demand for performance regardless of cost produced engines of very greatly increased power. This increase of power—applied with no corresponding increase in the useful load which machines were called upon to carry—proved not to increase speed to the extent which was hoped for with the class of wing which had previously been proved so useful.

This was because wings of the Blériot and similarly heavy cambered form, used as it been customary to use them, were afflicted by very great resistance at the fine angles of incidence corresponding to high speeds.

With the very large engine powers which were provided it was found that a bigger speed range could be attained by using a wing section of the low lift, low resistance type, and using a large surface. The result was bigger, heavier and more expensive machines, a slightly reduced climb but an enormous increase in the speeds attained.

For certain war purposes this development was justified. For fighting machines speed was all important, and the speeds demanded towards the end of the War could not have been attained on any then known wing of the high-lift type.

Their Value for War Purposes.

But for large seaplanes, for big bombers and such like machines, the maximum speeds reached at the end of the War were by no means so high that the high resistance of known high-lift wings would have counterbalanced the saving in machine weight which such wings could provide.

Nevertheless, the technical experts of the Air Services had become so obsessed by the value of a high Lift to Drag ratio as the sole criterion of the usefulness of a wing that every effort to develop high-lift wings was suppressed by one means or another. Not only this, but efforts to ameliorate the L/D ratio of known wings of the high-lift type were ridiculed.

Early Experiments with Wing Tips.

Now long before the war it was known to certain practical constructors that the poor qualities of high-lift wings could be greatly ameliorated by certain modifications of the wing tips. Certainly in 1911 Mr. Handley Page, and Mr. L. Howard Flanders, were using wings of the thick, heavily cambered type with gradually washed-out wing-tips, and such figures as are available of the performances of those wings show them to have been possessed of both a high lift and of a very fair L/D.

The Effect of "Wash-out."

Certainly Mr. Howard Flanders, probably Mr. Handley Page, recognised that, in reducing the camber and the

effective incidence of their wings from root to tip they were reducing the wing end losses, and were thereby reducing the resistance of their machines.

In 1915 the present writer, called upon to design certain machines with high lift wings, and remembering experiences which he had shared with Mr. L. Howard Flanders in 1911, took very considerable care in the design of the wing tips, and by washing out and reversing the camber produced what was for the time a high performance seaplane, though the wing, when tested by the N.P.L. in their standard *parallel* form, gave extremely bad results.

Nevertheless, the N.P.L. to this day is convinced that it is not possible to "wash out" a wing without destroying its efficiency, and their efforts to persuade the officials in power at the Air Ministry that "high lift" wings were useless were eminently successful.

Wings for War and Peace.

Now it may be conceded that to a very large extent the "high lift" wing as hitherto known was not suitable for war purposes, because in war victory at any price is cheaper than defeat—even if that be achieved at a low cost.

But for commercial purposes the question is altogether different. It has reverted to conditions somewhat analogous to those of 1910 or thereabouts. Then a low limit to the available power of engines, and the necessity of carrying a certain minimum load—to wit, one pilot—forced designers to seek a wing which allowed that load to be carried with the minimum possible power expenditure.

To-day, with relatively unlimited possibilities in the way of engine h.p., the need for the transport of load through the air at a reasonable cost calls in exactly the same manner for the minimum expenditure of power per ton of useful load carried.

Of the exact effect which high lift wings and high loadings may have on the prospects of cheap aerial transport, the regular readers of this journal should be adequately informed. Those who are not should refer to the previous articles which have appeared dealing with this subject.*

To one who—like the writer—has consistently preached the necessity for the experimental development of high lift wings, the last few months have been distinctly encouraging.

The new Handley Page wing—which has shown the possibility of increasing the maximum lift—hence the loading for a given landing speed—by some 50 per cent., and has shown that a maximum lift coefficient of 2½ times that given by the normal low resistance type can be reached, has even moved the N.P.L. to interest, and has suggested that within a reasonably short time really economical goods aeroplanes may take the air.

Further still it has been stated by yet another experienced aeroplane designer that he suspects himself of having achieved a lift coefficient almost the equal of Mr. Handley Page's best with no added excrescences to the wing section, and, lastly, there is the recent announcement by the Commercial Aeroplane Wing Syndicate of the results which have been attained by the "Alula" wing.

The "Alula" Wing.

The "Alula" wing is the result of a long series of experiments on aerofoils which began before the war, were continued under very grave difficulties during the war, and have now reached a stage wherein a direct application of the results to the design of commercial vehicles is possible.

The principle whereon it is based is that of avoiding end losses—and this avoidance of end losses is effected by grading the pressure distribution over the wing in such wise as to reduce as far as is possible the sudden change from wing to no wing which normally occurs at a wing tip.

This is actually achieved by a process of "washing out" the camber and the incidence of the wing from root to tip, and the resultant wing has a very great similarity to certain of the early experimental "bird wing" types of aerofoil, notably to those of the Weiss, Handley Page, Etrich and the German "Taube" type wings.

A Great Advance.

It is, however, claimed for the "Alula" wing that there is a very great advance over previous wings of somewhat similar type, in that by the aid of a long series of experiments, and by the mathematical analysis of the results of those experiments, the elements of a wing can now be calculated with close accuracy in such a way that the appropriate wing tip form to give the minimum of end losses can be designed with a certainty for any rational central rib section.

By the methods so evolved it has become possible to develop high lift wings possessing L/D ratios actually higher than those of the present standard types of high speed wing.

This claim seems abundantly justified by the appended table of model tests—results which have since been confirmed by test results on an experimental aeroplane when actually flown.

TESTS AT EAST LONDON COLLEGE ON "ALULA."
Wing No. 328.8 (double arched model), 4 in. x 36 in. at 40 ft. per second.

Angle of Incidence, Degrees.	Lift Co-efficient.	L/D.	Centre of Pressure Co-efficient.
0	0.191	7.0	0.575
1	0.241	10.5	0.496
2	0.290	13.3	0.447
3	0.338	15.8	0.422
4	0.386	18.3	0.418
5	0 432	20.6	0.406
6	0 476	22.2	0.395
7	0.521	22.85	0.398
8	0.566	22.9	0.388
9	0 621	22.5	0.381
10	0.660	21.8	0.378
11	0.709	20.9	0.371
12	0.761	19.85	0.365
13	0.799	18.8	0.350
14	0.823	17.5	0.340
15	0.827	16.1	0.335
16	0.822	14.6	0.335
17	0.814	12.9	0.340
18	0 800	10.8	0.352
19	0.784	8.6	0.369

A Confirmation.

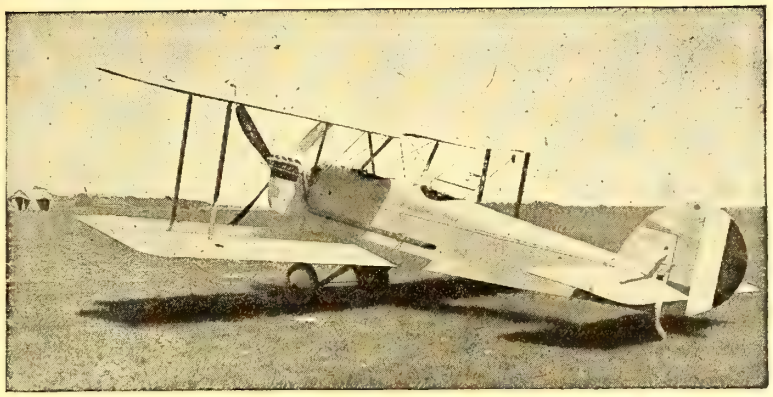
It is interesting to note that there is a very marked similarity between the figures for this wing and those obtained at the Laboratory of Koutchino before the war for a heavily cambered section when the end losses were prevented by testing the wing between vertical diaphrams raching from top to bottom of the wind tunnel and entirely closing the wing tips against end flow.

Thus it would seem that the "Alula" wing completely confirms the views of those who have consistently held that the bad qualities of previous high lift wings were entirely due to end losses and that only experiment was needed to discover the correct conditions for the avoidance of these losses.

The practical possibilities of the wing are best exhibited in the following statement made by the proprietors themselves.

The figures given for performance tally well with the test figures for the wing, the weights allowed for the structure seem adequate, and suffice to show that the "Alula" wing opens up enormous possibilities of greatly reduced costs for the moderate speed conveyance of goods in bulk.

* "The Design of Aircraft for Commercial Purposes," Sayers, THE AEROPLANE, Feb. 12th to June 4th, 1919. "On Aerial Tramps," L. H. Flanders, May 5th, 1920. "Handley Page and Other Wings," Sayers, April 21st, 1920.



THE BOULTON & PAUL—P. 9.

An Aeroplane which is a Sound Commercial and Private Proposition

In this P. 9 Machine we have, we feel, solved the problem of providing an Aeroplane which is a sound business proposition—and which combines with low cost the great essentials for Commercial and Private use. All our great resources of material and craftsmanship have been utilised. Scientific Research and Experiment by a staff associated with flying from its beginnings coupled with the great Experience gained through the building of thousands of Aeroplanes during the War, have been concentrated in the production of this P. 9 Model.

It is a Two-Seater—Single Engine Tractor—which has attained on test a speed of over 100 miles per hour.

Its outstanding features are :—

CHEAP AND EASILY HOUSED. The Initial cost is extremely low ——— and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size it is easy to handle on the ground and requires but little accommodation. The principal dimensions are: Span, 27 ft. 6 in.; Length, 25 ft.; Height, 10 ft.

EASY TO FLY. The P. 9 has a big speed range, and low landing speeds, and this combined with Stability at all trimming speeds and well-balanced controls, allows the machine to be flown for long periods without undue fatigue. It also gives the maximum of Safety possible.

COMFORT AND CONVENIENCE. The comfort of the Pilot and Passenger has been specially considered. Each Cockpit is roomy and fitted with our special Seats. Controls for both Flying and Engine are fitted in the fron and rear Cockpits to enable the machine to be flown from either position. The exhaust from engine is discharged behind the rear Cockpit giving a silencing effect and freedom from fumes. Two standard cases are provided for luggage and form part of the fairing immediately behind the rear Cockpit.

The uses to which this compact and efficient machine can be put are wide and various, and will suggest themselves to those who have been awaiting the stage of Aeronautical Development now reached by the P. 9. It can be used for dozens of Commercial Purposes. The same type carried photos from R. 34 direct to London. It has been sent to Australia for Sheep-runs—and will soon be in use in various parts of the world for Exploring Uncharted Territory, Examining Timber Tracts, Fighting Forest Fires, Carrying Mails to Distant Mines, Transition of Colonial Mails to Mail Steamers, and for General Patrolling and Police Purposes.

If you are interested—write for full particulars. State your needs or purpose, and our engineers will consider every detail closely—to advise soundly.

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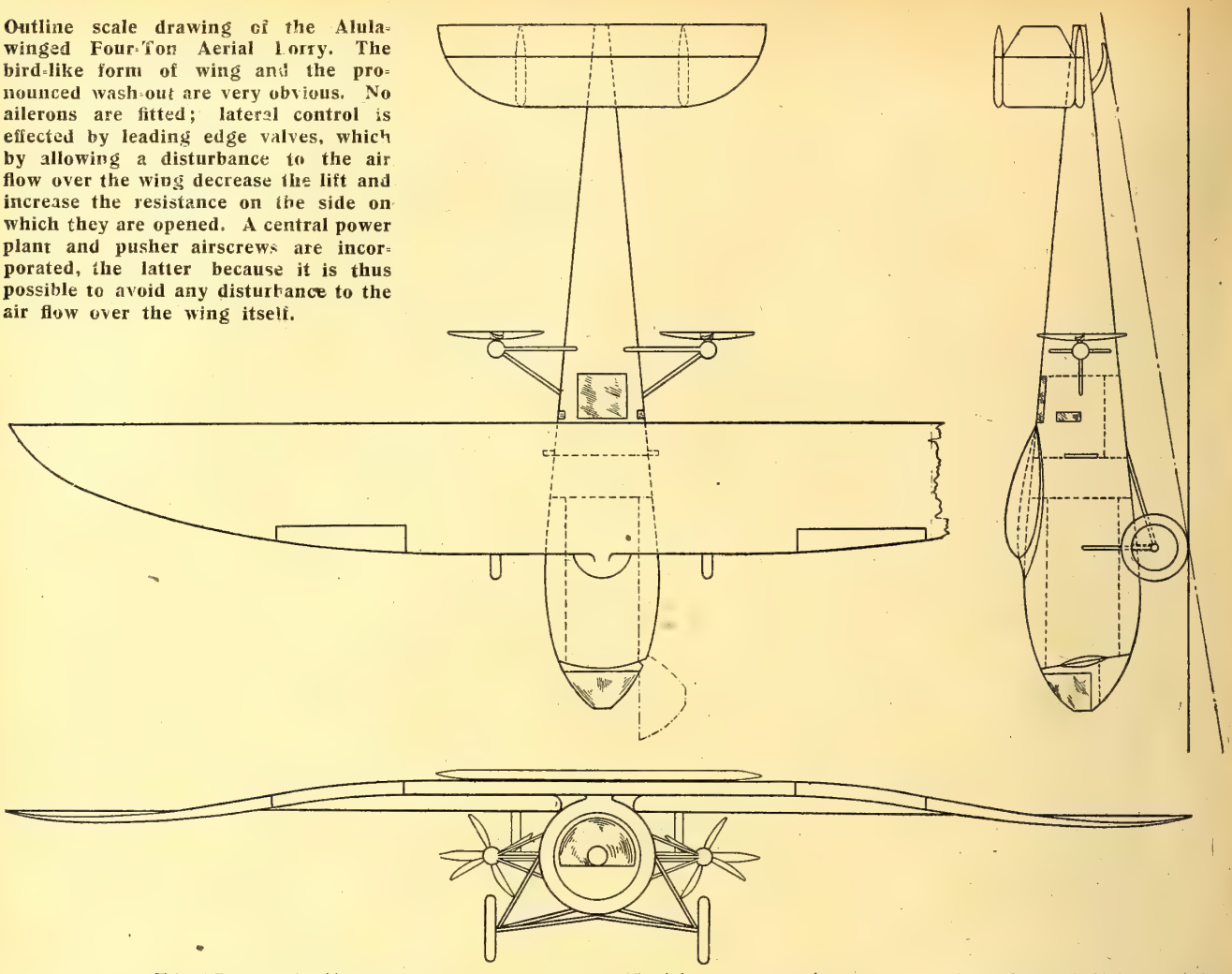
Outline scale drawing of the Alula-winged Four-Ton Aerial Lorry. The bird-like form of wing and the pronounced wash-out are very obvious. No ailerons are fitted; lateral control is effected by leading edge valves, which by allowing a disturbance to the air flow over the wing decrease the lift and increase the resistance on the side on which they are opened. A central power plant and pusher airscrews are incorporated, the latter because it is thus possible to avoid any disturbance to the air flow over the wing itself.



The "Pelican" 4-Ton Lorry.

This example of a cargo-carrying design using "Alula" wings is a cantilever monoplane. The wings and fuselage are both constructed of mahogany planking on the principle used in modern flying-boat hulls: this simplifies the machine and eliminates the bulk of the metal parts, fabric, etc., and will give great durability, a feature of the first importance in relation to depreciation charges.

The machine is a non-folder, being designed to dispense with shed costs altogether.

The crew consists of a pilot carried right forward and a mechanic in charge of the engine-room aft. The engines are twin Napier Lions, and the machine is designed to fly *and climb* even if one engine breaks down. Reliability of service is assured by this power to fly on one engine and by the superintendence of the engines in flight, coupled with the fact that all work is normally done at half-power.

The design has been prepared on a most conservative basis in all respects: for instance, an allowance of 7½ per cent. on all structure weight above the calculated figure has been included, and the factor of safety has been taken as 5 in the calculations, whereas 3 is nearer the ultimate mark for cargo machines; further, a 30-m.p.h. head wind is assumed in calculating the weight of fuel carried. There is, therefore, no doubt that the machine will do considerably better than the figures given by the calculation.

Span	146 ft.
Length	84 ft.
Height	22 ft.
Chord	16 ft.
Fuselage diameter	14 ft.
Weight—	
Wings	5,100 lb.
Fuselage	2,080 lb.
Tail	850 lb.
Chassis	1,160 lb.
Structure	9,190 lb.
7½ per cent. addition	690 lb.
Tanks	550 lb.
Engine & propeller mountings, radiators, silencers, etc.	970 lb.
Engines	1,680 lb.
Crew	360 lb.
Empty	13,440 lb.
Fuel (London-Paris)	1,660 lb.
Cargo (London-Paris)	9,000 lb.
Fuel (400 miles)	2,770 lb.
Cargo (400 miles)	7,890 lb.
Total	24,100 lb.
Performance—	
Landing speed	55 m.p.h.
Cruising speed	72 m.p.h.
Climb	410 ft. per min.
Climb on one engine	40 ft. per min.
Cruising revolutions	0.80 of normal
Cruising B.H.P.	0.51 of normal
Cruising consumption	243 lb. per hr
Other Particulars—	
Total horse power	920
Surface	1,870 sq. ft.
Pounds per sq. foot	12.9
Pounds per B.H.P.	26.2
Cargo space	1,700 cub. ft.
London-Paris cargo	4 tons
400 miles cargo	3½ tons
Gliding angle	1 in 15

Figures Taken in Calculating Cost of Operating.

1½ pilots, 2½ mechanics, and 2 labourers per machine, and insurance of flying crew, per annum	£2,270
Petrol, 3s. per gallon; oil, 5s. per gallon; giving a combined figure in pence per pound of	5.16
Material reckoned as 1 machine and 1 spare engine, totalling 13,920 lb., and costing approximately	£13,920*
Depreciation, allowing for replacement of material in	1 year
Insurance equivalent to replacing the material in	1,600 flying hours

Establishment and aerodrome charges are not included, as they vary so much with the size and other conditions of the service. They must, of course, be added to the figures given hereafter.

	London-Paris (240 miles)	400-mile route
Cargo per run	4 tons	3½ tons
Journeys per week	3 double journeys	3 single journeys
Single journeys per year	312†	156
Cargo carried per year	1,248 tons	546 tons

* This will be much less when a number of similar machines are ordered together.

† This will be much more when a well-lighted route makes night work feasible.

Operating Costs.

	London-Paris.	400-mile route.
Annual cost of running	£30,680	£28,260
Cost per lb. carried the distance	2.6d.	5.5d.
Cost per ton-mile	2/0½	2/7

The figure of 1 year for depreciation is unduly conservative for a boat-built structure. A figure of 3 years is a fairer estimate and gives—

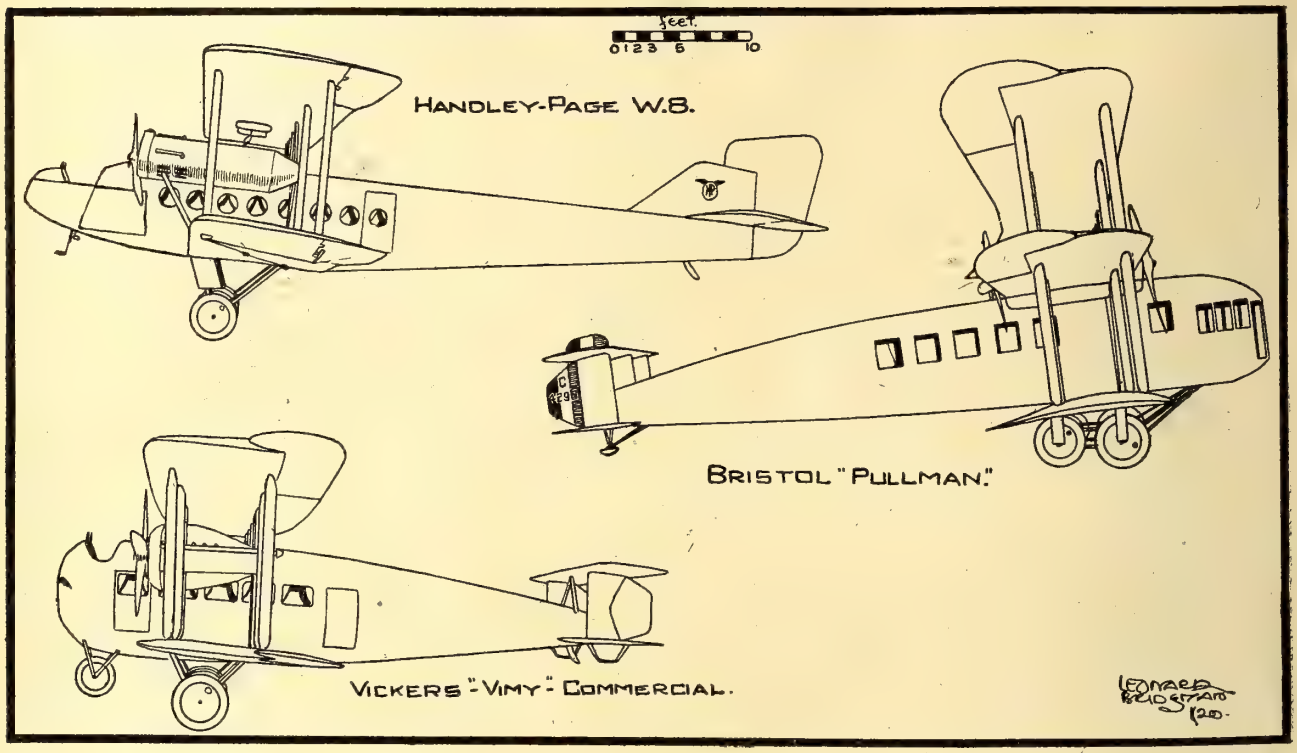
	London-Paris.	400-mile route.
Annual cost of running	£21,400	£18,980
Cost per lb. carried the distance	1.8d.	3.7d.
Cost per ton-mile	1/5	1/9

BEARDMORE

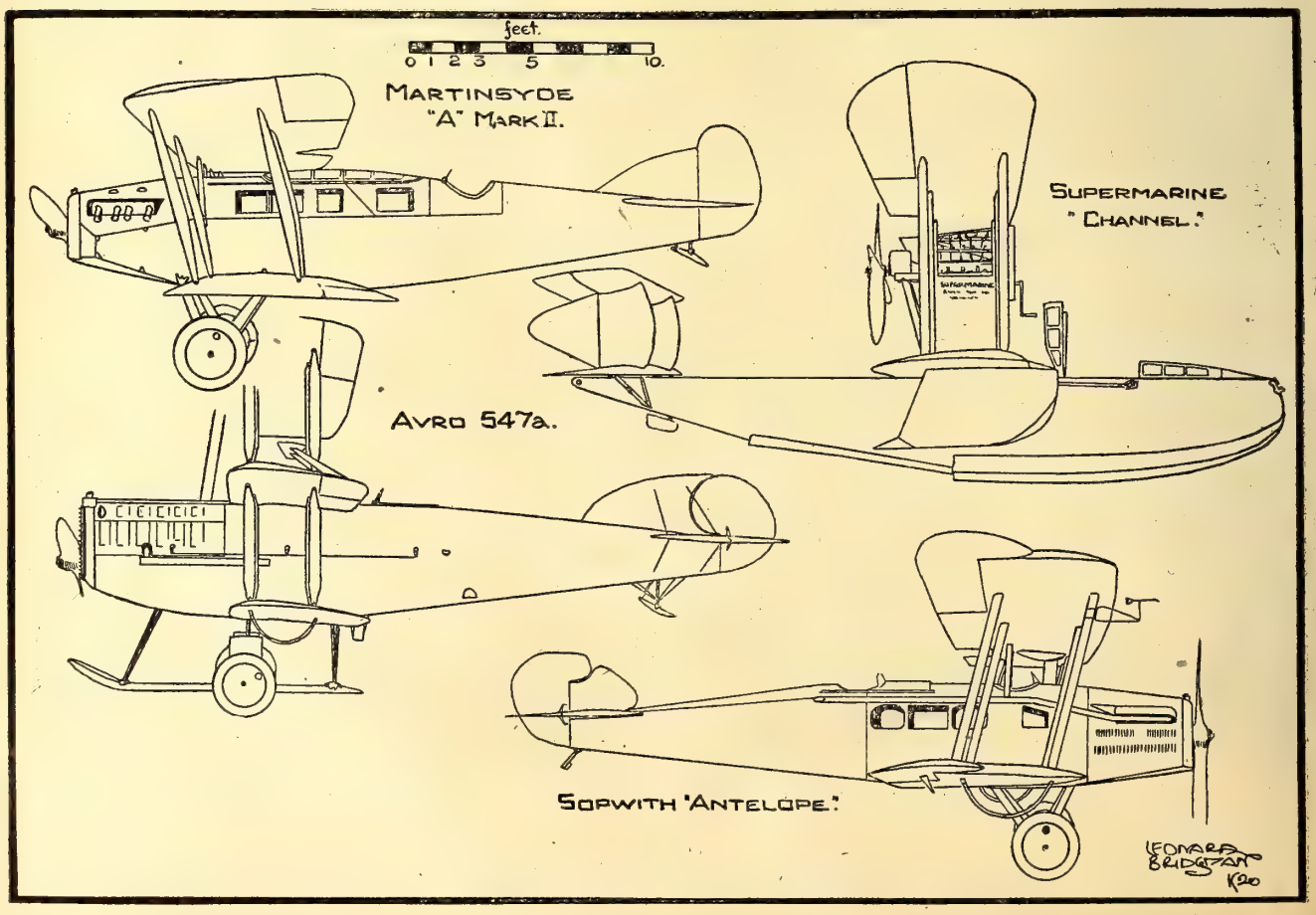
AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

AEROPLANES AT OLYMPIA.



In the sketches which appear on this and the two following pages Mr. Leonard Bridgman has depicted a side view of each of the complete machines which appeared at Olympia. These sketches are all of them approximately to scale, but the scale of the first sketch of the three giant machines is roughly one-half of that of the remaining five sketches, thus indicating the very big gap which exists between the large multiple-engined machines and the more usual single-engined types in size.



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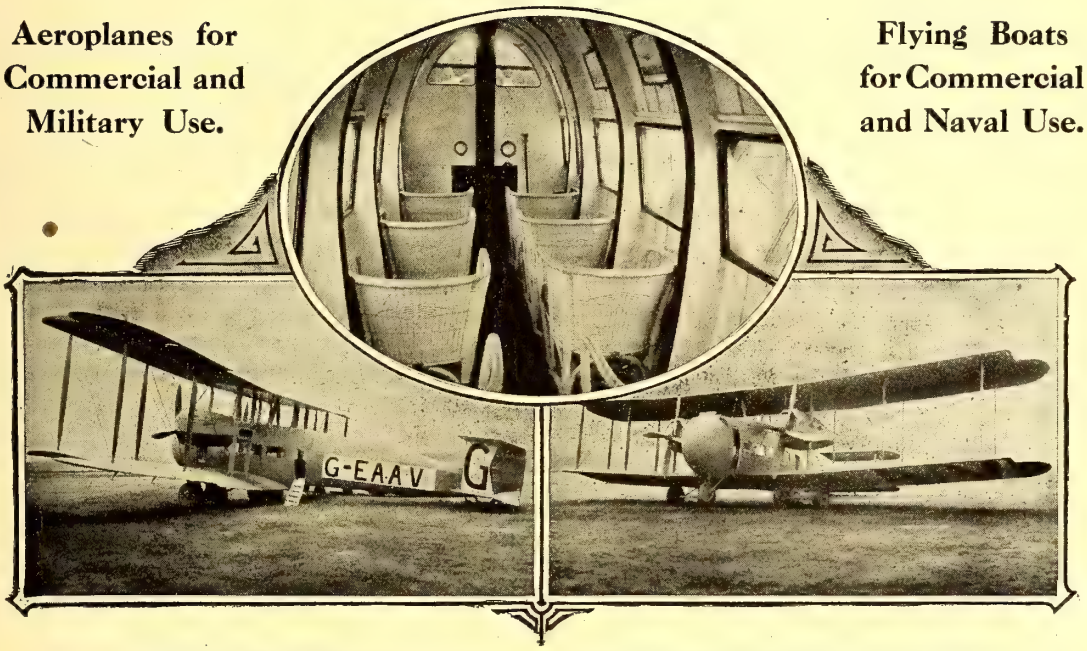
Flying Boats for Commercial and Naval Use.



"VICKERS - VIMY - COMMERCIAL"

1 Pilot and 11 Passengers or 1½ Tons of Mail or Freight. Endurance 5 hours.

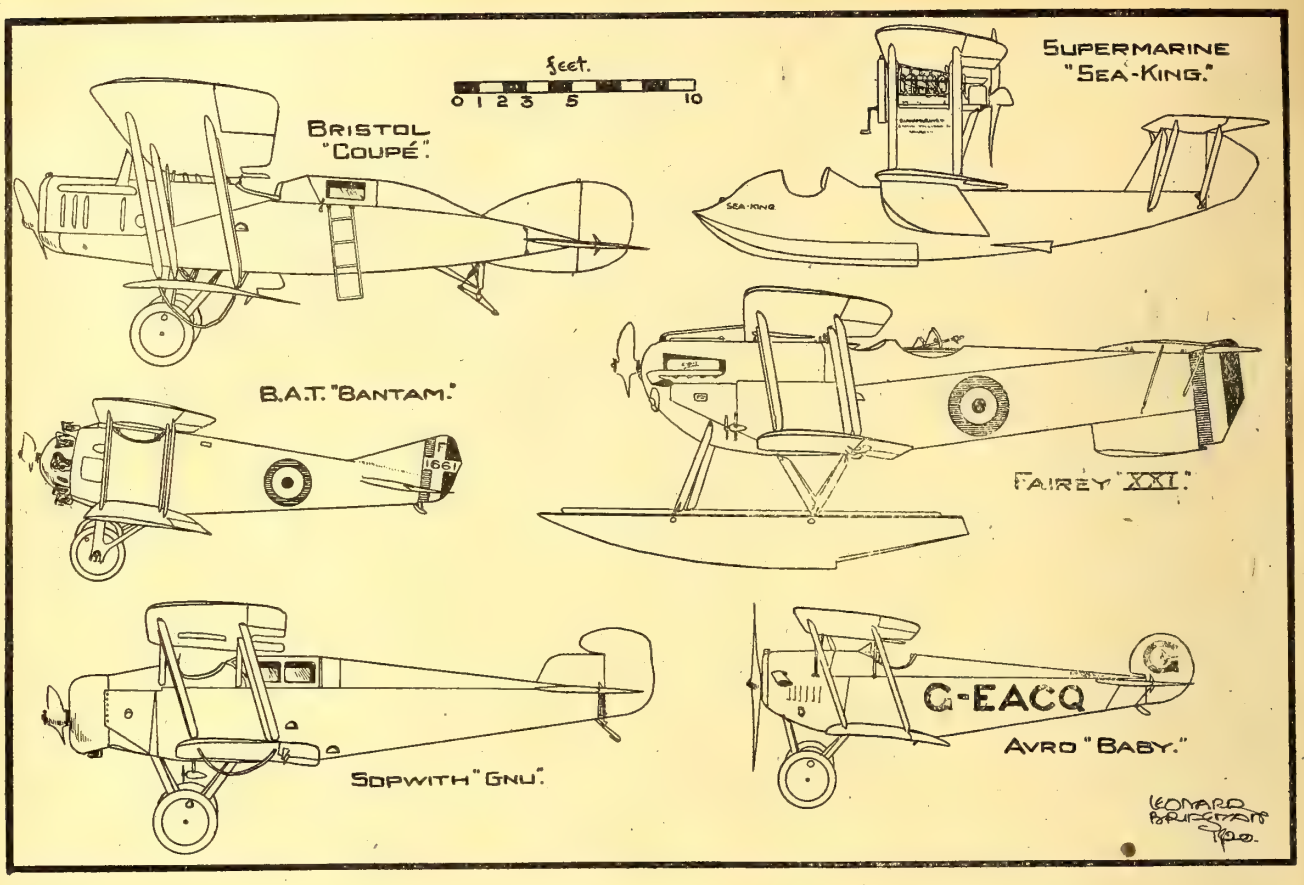
A factor of Safety of 5 throughout.

Vickers-Saunders Flying Boats.

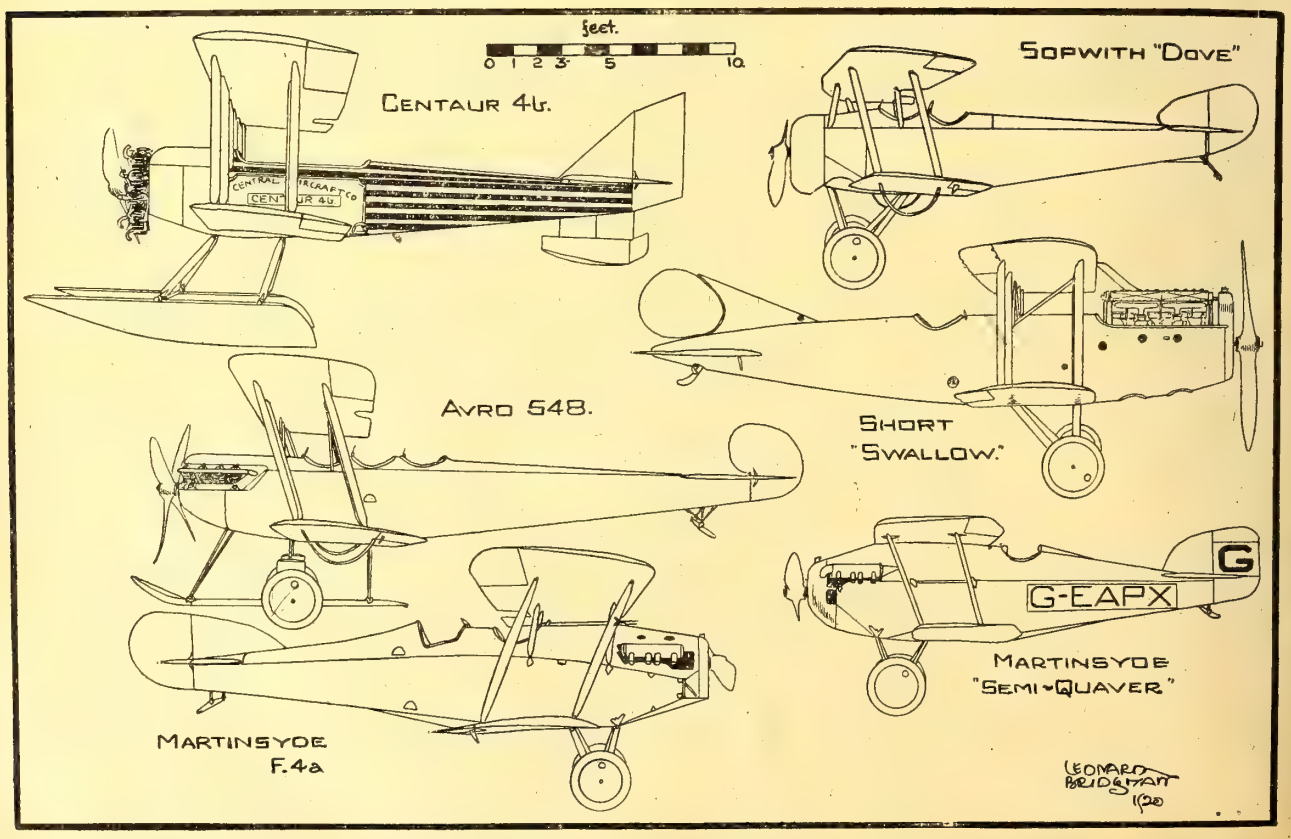
PEACE PRODUCTS EXHIBITS at the GREAT VICTORY EXHIBITION, STAND 151/160, CRYSTAL PALACE.

Aviation Department:

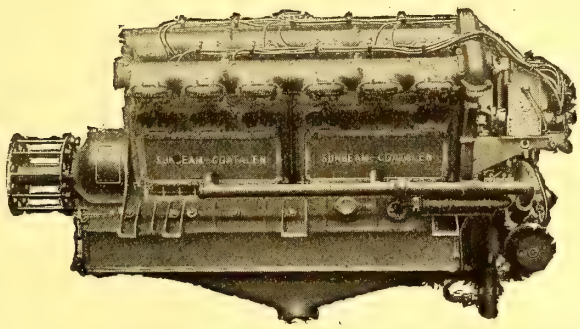
Vickers House, Broadway, London, S.W.1.



A noticeable feature of the two sketches on this page is the very slight difference in size which exists between the Avro Baby of 35 h.p., the B.A.T. Bantam of 200 h.p., and Martinsyde Semiquaver of 300 h.p. These powers, together with the speeds which the machines can attain with them—roughly 85, 140, and 160 m.p.h. respectively—is an eloquent example of the cost of speed. It should be noted also that, divested of the glitter of aluminium, the Short "Swallow" betrays in form no evidence of its metallic construction.



SUNBEAM-COATALEN AIRCRAFT ENGINES

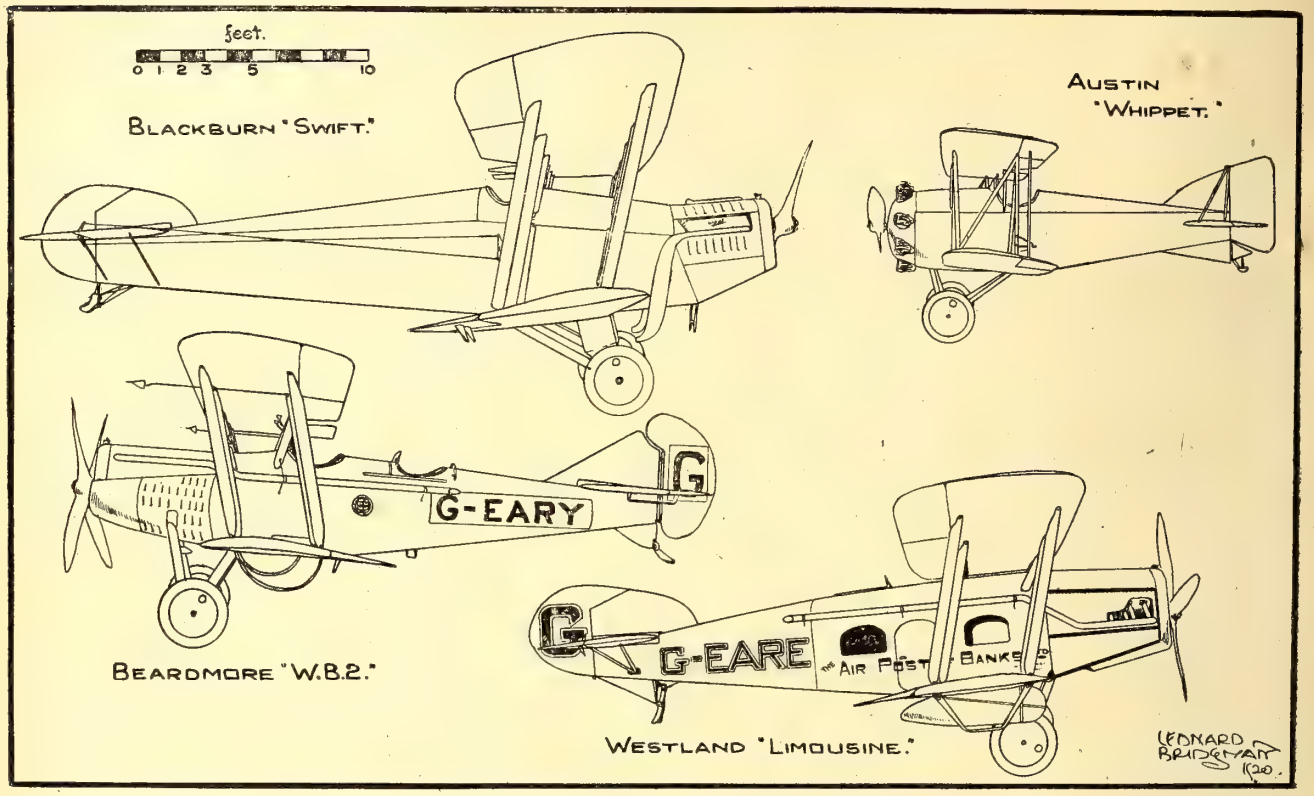


These engines of which an example, the "Manitou" of 300 h.p., is here depicted, have won a wide and enviable reputation for

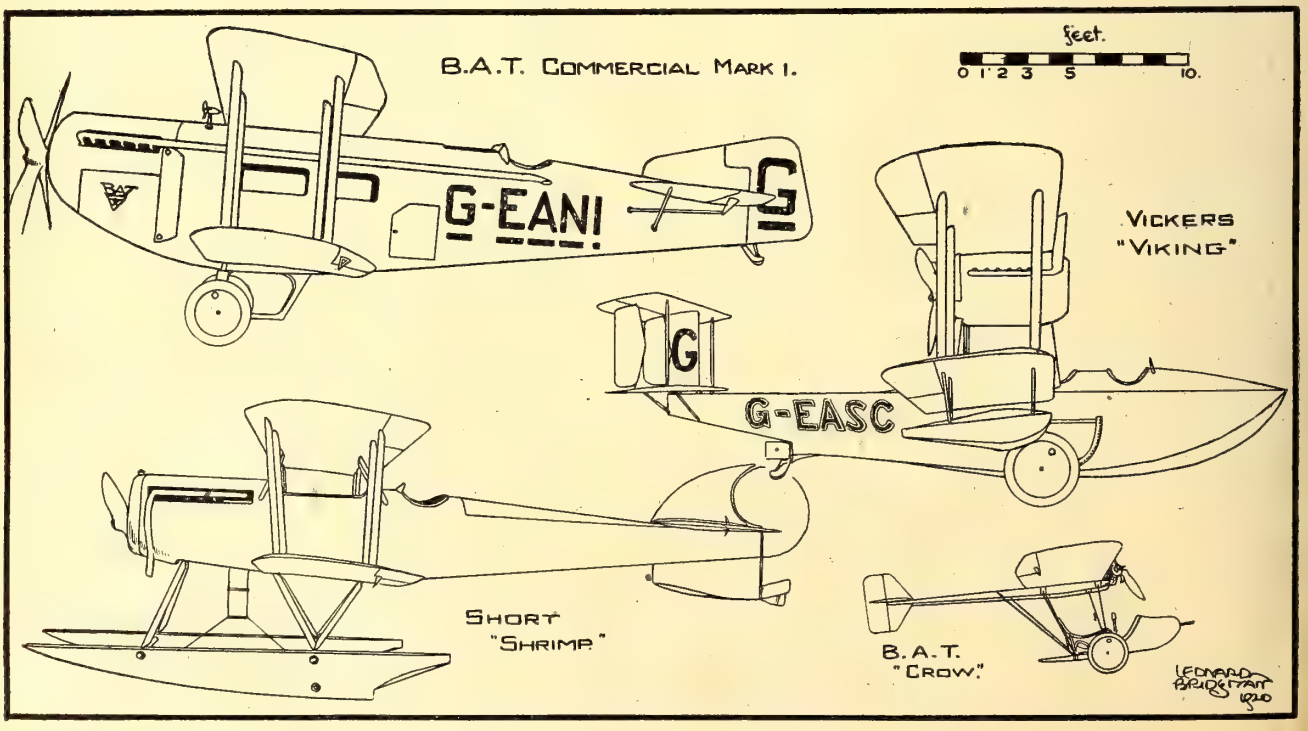
EFFICIENCY AND RELIABILITY

The Company were pioneers in aviation engine production long prior to the war, and their wealth of designing and manufacturing experience ensures the uniform excellence of their productions.

The Sunbeam Motor Car Co., Ltd., Moorfield Works, Wolverhampton.



The sketches on this page are particularly interesting. A comparison of the Blackburn "Swift," designed expressly for war purposes, with the Austin "Whippet" and the B.A.T. and Westland limousines indicate that so far designers have gone but a little way towards evolving special types for special purposes. This conclusion is in these sketches confirmed by the Short "Shrimp," which shows the conventional tractor biplane on floats, but opposed by the Vickers "Viking" and the B.A.T. "Crow"; but even these two latter machines conform to the standard arrangement of wing and tail surfaces, and differ little in their aerodynamic proportions from all the remainder. It will be interesting to observe to what extent the new activity in experiments with special wings for commercial purposes will affect this apparent sameness of proportions.



Beardmore

AMONG THOSE WHO FLY BEARDMORE RELIABILITY IS A BY-WORD

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Works - Parkhead Steel Works, Glasgow.

These famous power units are being installed by many of the leading Aircraft Manufacturers in their most recently designed machines.

The names of only a few fitted with the 160 h.p. Beardmore Engine are given below.

Armstrong-Whitworth F.K.8.

Avro 5-seater Triplane.

Sporting Short Seaplane.

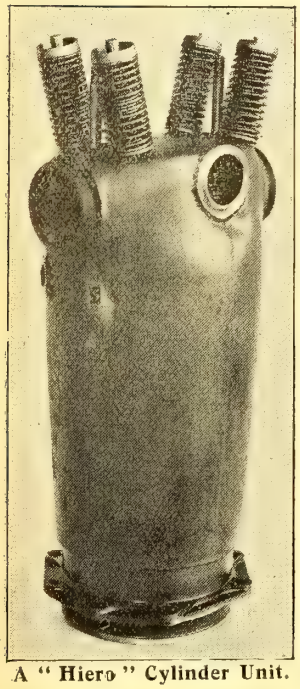
The Central Aircraft Coy's Passenger-carrying Limousine.

Aeronautical Engineering says of the latter "By using two of the 160 h.p. Beardmore Engines a power plant of proved reliability known to call for very low maintenance costs is attained."

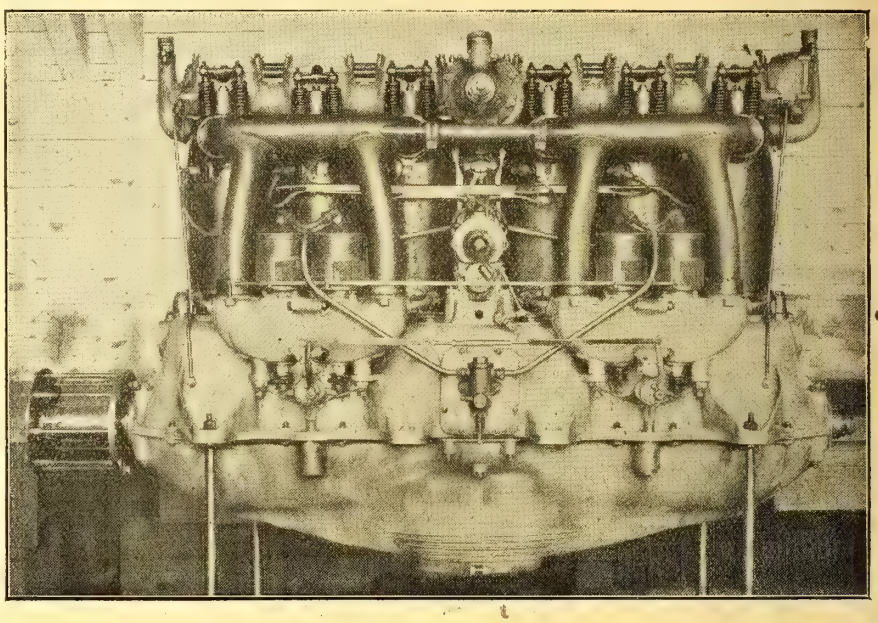
AeroEngines

THE AUSTRIAN "HIERO" AERO ENGINES.

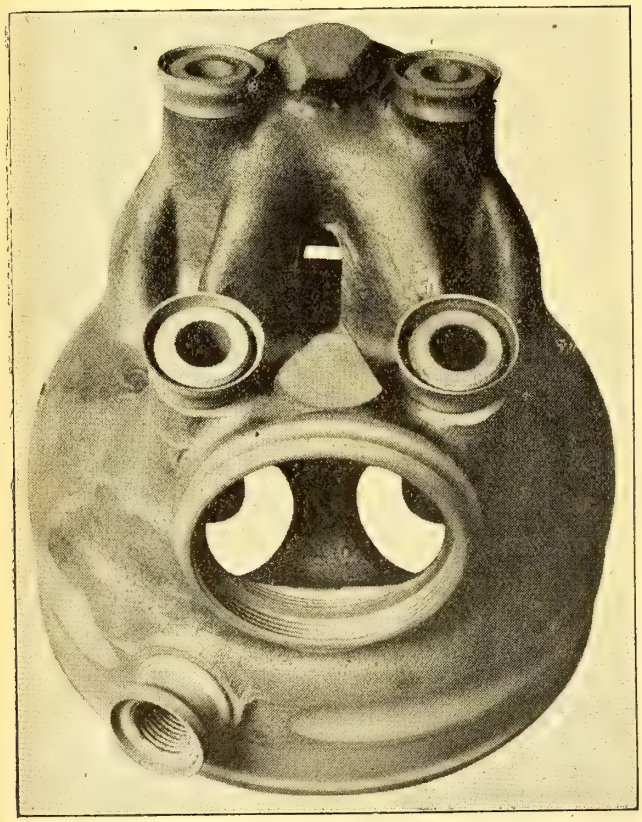
By ERIC HILDESHEIM, B.A., Copenhagen.



A "Hiero" Cylinder Unit.



The 1918 type 300-h.p. "Hiero" Engine.



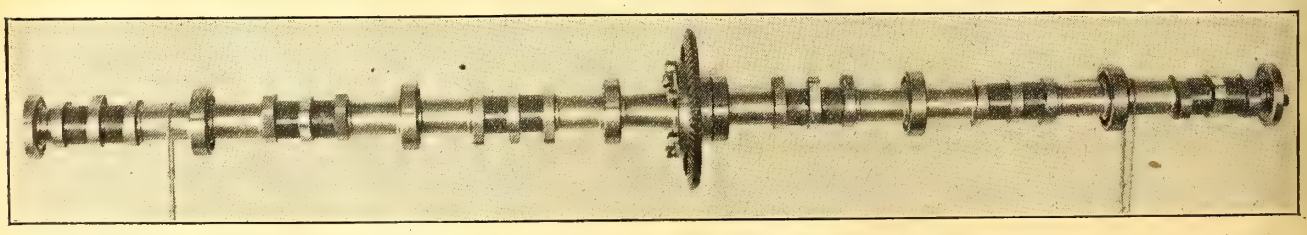
A 'Hiero" Cylinder Head, showing the valve seats and ports.

Whereas England at the outbreak of war had aeroplanes second to none (the 80-h.p. Avro and the Bristol "Bullet" and Sopwith "Tabloid," to quote a few leads), but for aero engines were dependent upon France, the opposite position prevailed in Austria, where both the Austro-Daimler and Warchalowski Eissler companies turned out first-class 6-cylinder engines, while the aeroplane manufacturers had with the exception of the Lohner arrow tractor biplane and flying-boats, to go to Germany for models.

While the Austro-Daimler aero engines have always been well known in England since Beardmore took up their manufacture under licence before the war and later models have been reported upon officially, the products of the other company, termed "Hiero" after the designer, Hieronimus, have been neglected, though the type ranks second to none of the long list of 6-cylinder vertical aero engines which have both in the opponent and in the Allied countries distinguished themselves by reliability. The "Hiero" scores even among them by a specially low oil consumption.

The "Hiero" aero engine has developed from the 4-cylinder 50-60-h.p. model, produced during 1908 and 1909 by the Austrian Laurin and Klement Automobile Works. This had two valves in the head, operated by a common push rod from a camshaft, mounted at the side of the crankcase. The weight was 106 kg., the petrol consumption was 275 gr. per h.p. and hour, and that of oil 19 gr. per h.p./h. The 4-cylinder "Hiero" engine produced during 1910-1913 was of similar layout, except for the provision of a separate push-rod for each valve. The horse-power was 85 to 95 and the weight 145 kg., and the petrol and oil consumption had dropped to 250 and 15 gr. per h.p./h. In 1914 an 8-cylinder 200-220-h.p. model of 260 kg. weight was produced before the war with a further fuel consumption reduction to 230 gr. per h.p. hour. Early in the war in the same year the first 6-cylinder vertical type was turned out with a bore and stroke of 130 by 160 mm. The enlarged 1915 edition of 200/215 h.p. had a bore of 135 mm. and 180 mm. stroke, a petrol consumption of 220 gr. and 4 gr. of oil per h.p./h. and had an overhead camshaft.

In 1916 came the 230-240-h.p. model (140 by 180 mm.) with the introduction of 4 valves per cylinder. The weight was 400 kg. against 340 kg. in the previous model. A special Schiske carburetter was employed as the standard, except



The central-drive Camshaft of a modern "Hiero" Engine. The arrangement allows of a light yet stiff shaft, as the length over which torsion may occur is halved.

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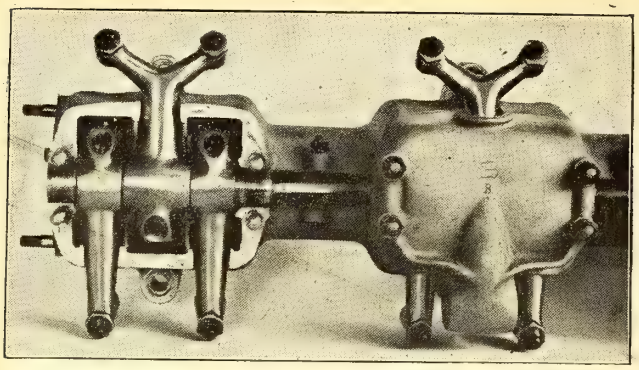


Part of the "Hiero" Valve Gear, showing the form of valve rockers used to operate the four valves per cylinder.

the first models, which were Zenith equipped. This was a twin-type as in the first 6-cylinder engine, but all the other engines were provided with two single carburetters. 1918 saw the introduction of the 300-320 h.p. model (155 mm. bore by 200 mm. stroke) of 400 kg. weight, and in 1919 an edition of the same dimensions and weight as the 1916 model, but of slightly increased horse-power (240-250), was built, so it may be taken that the model is a super-compressed one for altitude flying. Two other "Hiero" engines out too late for the war were the 180-190-h.p. (160 by 150 mm. bore and stroke), of 210 kg. weight, for which the extraordinary low petrol consumption of 120 gr. per h.p./h. is claimed, and a 270-280 model (160 × 150) of 230 kg. weight, for which one fails to see the direct object.

The most interesting news is perhaps that the Warchalowski Eissler Co. manufactures now a twin-cylinder horizontal-opposed engine for sporting aeroplanes, which is to be the power plant of the W.K.F. mount, and may be used by others too, when the low Austrian exchange rate is recalled. This air-cooled 35-40-h.p. engine has a bore of 140 mm., a stroke of 180 mm., two valves per cylinder, each operated by a push rod from a side camshaft. As in all the "Hiero" engines, the r.p.m. are 1,400. The weight amounts to 80 kg., the petrol consumption to 220 gr. petrol and 7 gr. of oil per h.p. hour.

INSURANCE IGNORANCE.

In the majority of Insurance Policies, one comes across the following :—"Do you engage or have you any intention of engaging in Aviation or any other hazardous pursuit?" or words to that effect. Can it be possible that there are still people in whose minds progress is so stilted that they really do in their own minds believe that commercial aviation is dangerous? Consider a week's work on the Continental air lines : 122 machines, 345 persons and several tons of merchandise, without one single accident. Does this look like a "hazardous pursuit"? Moreover, this work has been going on week after week without one accident, while day after day one reads of motor car accidents, train smashes, etc. It must also be remembered that every aeroplane smash is given a prominent place in the newspapers, whilst nine out of every ten motor car accidents are not even reported.

After a recent crash had been extensively reported in the daily news sheets, one was told that it was pure suicide to carry on or encourage flying. One therefore took the trouble to scan the said news sheets to see if there were any other types of accidents. Using the same logic as the aforementioned anti-aviation enthusiast, one was forced to the conclusion that it must be pure suicide to indulge in the following pastimes, recreations, or under whatever heading they come :—

(i) Motoring : Car turned somersault, driver killed. (ii) Boating : Seven drowned by pleasure boat capsizing. (iii) Posting letters : Old lady killed in crossing road to post letter. (iv) Leaning : Wall collapsed; people leaning against it killed. (v) Travelling by train : Two fatal railway accidents. (vi) *Laughing* : Whilst laughing, old gentleman was seized with heart failure and died.

Accordingly, if one were strictly honest, one would have to answer the insurance companies' questions as follows :—"Yes. Besides flying, one goes by train every morning, and occasionally by motorbus. One sometimes goes in a boat, and makes a habit of laughing and posting letters, and when tired one occasionally leans. One has been known to step off a moving staircase with the wrong foot, and then, of course, there is always a certain element of danger present on press day."

It all rather reminds one of the song in "Hullo, America" sung by Stanley Lupino, "What one can do if one wants to when one tries."

Another rather important point is the way in which certain parents forbid or dissuade their children from flying. Apart from merely showing their ignorance, this is really a singularly unpatriotic and selfish action. The rising generation must not, in the interests of the country, be scared of flying, because in the next war we shall need every one we can get for the Royal Air Force, and there will not then be the same bait of high pay and cushy jobs which proved such a draw and a drawback in the last war but one (this is dating from July 1st, 1920). Therefore it is up to all to do their utmost to encourage flying, otherwise we shall have those very people who now discourage their children from flying, shrieking out invectives to know where the Royal Air Force is, when they (the parents) are sitting in their cellars listening to the bombs being dropped by the Slav Air Force. If this happens, they will only have themselves to blame.—G. D.

A MATTER OF AERIAL TELEPHONES.

In the account recently published of the R.A.F. Tournament at Hendon, it was stated that the formation of Bristol Fighters which performed so impressively under the command of squadron-Leader Johnston, was fitted with wireless telephones. One is informed on evidence which cannot be doubted that these machines were not in fact so fitted.

Even on the assumption that wireless telephones were used, the performance of this formation was such as to earn the highest admiration of the most experienced judges of airmanship—using the word in its true and not in its *Daily Mail* sense. The fact that such manœuvres were performed without the aid of telephones and merely with visual signals makes the display nothing short of marvellous. The unfailing accuracy with which every movement was made gives one some idea, not only of the skill of the individual pilots, but of the care which was taken in rehearsing for the performance.

One offers renewed congratulations to the officers concerned, and one repeats the hope expressed in the article in question, that next year we may see a full squadron, this time equipped with telephones, manœuvring under the same admirable leadership.—C. G. G.

A USEFUL ADJUNCT AT THE AERIAL DERBY.

Among those who helped to make the Aerial Derby Meeting a success were the London Telephone (New System) Co., Ltd. This firm, at very short notice, laid special telephone lines from the observers' post at all the turning-points on the Derby course and connected them by their special method to the nearest permanently installed instrument, so that the observer could telephone direct to the central control at Hendon without leaving his post. In this way the officials at Hendon knew who had passed the various points within a few seconds of their having done so.

As an example of the work done by the firm one may mention that a line was run from the middle of the white cross at Brooklands to an instrument in the sheds. Another line was dropped from the top of Epsom Church tower and connected with a permanent instrument near by. And other lines were connected similarly at the other turning-points In all cases the instruments sent by the L.T. (N.S) Co., Ltd., operated perfectly and transmitted their messages as clearly and distinctly as the telephonists were able to send them.

There are many occasions on which similar temporary telephone connections are desirable, and those in need of such methods of communication will be sure of receiving satisfaction if they use the New System.

Where all controls worked so well it would be invidious to make comparisons, but certainly none worked better than that at Hertford, where Mrs. Henry Knox acted as volunteer telephonist for nearly five hours at a stretch. The fact that this sporting little lady did such a long spell of work is both a compliment and a testimonial to the firm and its installation.

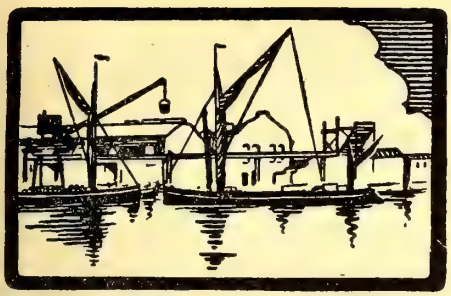
STEEL FOR AUTOMOBILE AND KINDRED CONSTRUCTIONS.

The very extended research on automobile steels which has been carried out by the Research Committee of the Institution of Automobile Engineers has now been brought to a successful conclusion, and at a meeting held on the 21st inst. the report was finally approved. It is hoped that it will be ready for issue by about the end of August, when a further announcement in regard to price, etc., will be made.

The report will contain a vast amount of information in regard to the physical properties of the 10 automobile standard steels of which the specifications are given in British Engineering Standards Association Report No. 75, with coloured charts showing these properties under various heat treatments as represented by the tensile, Izod, and Brinell tests.

The real work has been carried out by the Executive Sub-Committee, of which Mr. A. A. Remington was chairman up to a certain point, Mr. J. H. S. Dickenson assuming that office for the latter part of the period of research. The remainder of the members of the Sub-Committee were Messrs. Hy. Brearley, J. Wortley Fawcett, Brig.-Gen. R. K. Bagnall-Wild, C.B.E., Major H. P. Philpot, and Capt E. W. Birch.

The edition will be very limited, and will be obtainable in the first place from the offices of the Institution of Automobile Engineers, 28, Victoria Street, London, S.W.1.



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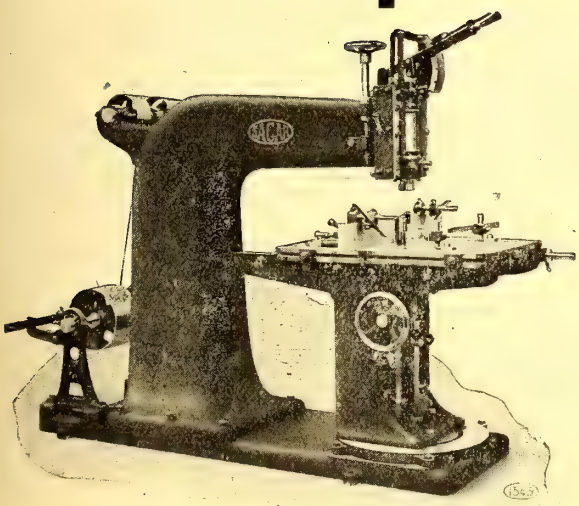

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(*Continued from page 286.*)

Aerodrome or Seaplane Station. Name.	Lat deg.	Lat m.	Lat s.	Long deg.	Long m.	Long s.	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name	Dist. from Aerod'e miles	True bearing from Aerod'e
Lee-on-Solent (*S*)	50	48	30N	1	12	30W	—	Lee-on-Solent (L. & S.W.R.) ½ mile	Portsmouth	11	E.
									Gosport	4	E.S.E.
									Southampton	11	N.W.
Leuchars	56	22	30N	2	52	30W	20	Leuchars Junction (N.E.R.) ½mile	St. Andrews	6	S.E.
Manston	51	21	0N	1	21	0E	140	Minster (S.E. & C.R.) 2 miles	Ramsgate	3	E.S.E.
								Birchington (S.E. & C.R.) 3 miles	Minster	2	S.W.
Martlesham	52	3	30N	1	16	0E	100	Bealings (G.E.R.) 1 mile	Ipswich	5	W.
								Woodbridge (G.E.R.) 4 miles			
Netheravon	51	15	30N	1	46	0W	400	Bulford (L. & S.W.R.) 4 miles	Salisbury	13	S.
								Pewsey (G.W.R.) 6 miles			
Orfordness	52	5	0N	1	33	30E	5	Woodbridge (G.E.R.) 14 miles	Ipswich	18	W.S.W.
								Aldeburgh (G.E.R.) 5 miles	Woodbridge	12	W.
Scopwick	53	6	0N	0	26	30W	100	Scopwick (G.E.R.) 3 miles	Lincoln	9½	N.N.W.
								Navenby (G.N.R.) 6 miles	Sleaford	8	S. by E.
Shotwick	53	14	0N	2	59	0W	16	Queensferry (L. & N.W.) 2 miles	Chester	6	S.E.
								Welsh Road Halt (G.C.R.) on aerodrome			
Smoogroo	58	53	0N	3	7	30W	—	Thurso (H.R.) Scotland, by boat 36 miles	Kirkwall, Orkneys	8	N.E.
Spittlegate	52	54	0N	0	36	0W	400	Grantham (G.N.R.) 2 miles	Grantham	2	N.W.
Stonehenge	51	10	0N	1	50	0W	320	Amesbury (L. & S.W.R.) 3 miles	Salisbury	9	S. by E.
Upavon	51	16	30N	1	47	30W	400	Pewsey (G.W.R.) 3 miles	Pewsey	5	N.
									Salisbury	15	S.
Worthy Down	51	6	0N	1	19	0W	300	Winchester (L. & S.W.R.) 4½ miles	Winchester	5	S.

(B) STATIONS TEMPORARILY RETAINED FOR SERVICE PURPOSES.

It should be assumed that no facilities usually exist at these Stations for dealing with Civil Aircraft.

Aerodrome or Seaplane Station. Name.	Lat deg.	Lat m.	Lat s.	Long deg.	Long m.	Long s.	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name	Dist. from Aerod'e miles	True bearing from Aerod'e
Anglesey	53	15	0N	4	22	30W	185	Llangefni (L. & N.W.R.) 3 miles	Llangefni	3	E.
Barlow (*A*)	53	0	45N	1	0	0W	20	Barlow (N.E.R.) ½ mile			
								Selby (N.E.R.) 3½ miles	Selby	3½	N.E.
Barrow (Walney) (*A*)	54	7	0N	2	15	30W	78	Barrow Central (Furness Rly. 1½ miles)	Barrow-in-Furness	1	E.
Castlebar	53	51	0N	9	16	30W	155	Castlebar (M. & G.W.R.) 1 mile	Castlebar	1	W.N.W.
Chingford	51	38	0N	0	1	20W	50	Ponder's End (G.E.R.) ½ mile	Chingford	1	E.
East Fortune (*A*)	56	0	0N	2	0	43W	100	East Fortune (N.B.R.) adjoining	Haddington	4	S.W.
Feltham	51	26	30N	0	24	0W	60	Feltham (L. & S.W.R.) 1 mile	Hounslow	2	N.E.
									Charing Cross	16	N.E.
Inchinnan	56	53	0N	4	26	30W	24	Houston (G. & S.W.R.) 1 mile; Glasgow (N.B.R. & Cal. Rly.) 7 miles	Glasgow	7	E. by S.
Killingholme (*S*)	53	40	0N	0	15	0W	10	Habrough (G.C.R. 6 miles; East Halton (G.C.R. Branch) 1 mile	Grimsby	9½	S.E.
Kingsworth	51	25	30N	0	36	30E	30	Beluncle Halt (S.E. & C.R.) ½ mile	Strood	5½	S.W.
									Chatham	7½	S.W.
Longside (*A*)	57	28	0N	1	57	0W	200	Longside (G.N. of S.R.) 4 miles	Peterhead	7	N.E.
Luce Bay (*A*)	54	51	0N	4	55	30W	40	Stranraer Harbour (G. & S.W.R.), 5 miles	Stranraer	5	N.W.
Oranmore	53	17	0N	8	55	20W	70	Oranmore (M. and G.W.R.) ¼ mile	Galway	5	W.
Polegate (*A*)	50	48	30N	0	14	30E	34	Polegate (L.B. & S.C.R.) 1 mile	Eastbourne	3	S.S.W.
Pulham (*A*)	52	24	30N	1	13	20E	130	Pulham St. Mary (G.E.R.) ¾ mile	Harleston	3	E.
									Norwich	16	N.N.E.
Shoreham	50	50	20N	0	17	30W	10	Shoreham (L.B. & S.C.R.) 1 mile	Brighton	6½	E.
Thetford	52	23	30N	0	47	30E	100	Thetford (G.E.R.) 2 miles	Thetford	2	N.W.

(*A*) Airship station; (*S*) Seaplane station.

(C) CIVIL STATIONS.

Aerodrome or Seaplane Station. Name.	Lat. deg.	Lat. m.	Lat. s	Long. deg.	Long. m.	Long. s.	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name.	Dist. from Aerod'e miles	True bearing from Aerod'e
Bedford (*A*)	52	6	30N	0	25	0W	100	Bedford (M.R.) 3 miles	Bedford	3	S.E.
Manchester	53	26	0N	2	15	0W	100	Alexandra Park (G.C.R.) ¼ mile	Manchester	3	N.
Penshurst	51	12	0N	0	11	0E	170	Penshurst (S.E. & C.R.) 1 mile	Tonbridge	5	E.
									Sevenoaks	7	N.
Renfrew	55	51	40N	4	23	30W	30	Renfrew (G. & S.W.R.) 1 mile	Renfrew	1	N.

(*A*) Airship station

LIST C.

LICENSED CIVIL AERODROMES.

(A) CIVIL AERODROMES LICENSED FOR ALL TYPES, THE LICENCES OF WHICH WERE STILL IN FORCE ON JULY 1ST, 1920.

Aerodrome or Seaplane Station. Name.	Lat. deg.	Lat. m.	Lat. s.	Long. deg.	Long. m	Long. s.	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name	Dist. from Aerod'e miles	True bearing from Aerod'e
†Brough	53	43	30N	0	34	9W	75	Brough (N.E.R.) ¼ mile	Hull	12	E.
Castle Bromwich	51	30	45N	1	47	30W	270	Castle Bromwich (M.R.), at S.W. corner of Aerodrome	Birmingham	5½	S.W.
Cricklewood	51	34	0N	0	13	0W	180	Cricklewood (M.R.) ¼ mile	Cricklewood	¼	S.
									Charing Cross	6	S.E.
Eastbourne	50	48	0N	0	18	0E	15	Eastbourne (L.B. & S.C.R.) 2 miles	Eastbourne	1	S.W.
†Ensbury Park (Bournmth)	50	45	30N	1	53	0W	100	Bournemouth Central (L. & S.W.R.) 2½ m.			
								Bournemouth West, 3 miles	Bournemouth	3	S.
Filton	51	31	0N	2	35	0W	200	Filton (G.W.R.) 1 mile	Bristol	5	S.
								Bristol (G.W.R. & M.R.) 5 miles			
Hendon	51	36	0N	0	14	30W	170	Hendon (G.N.R. & M.R.) 1¼ miles	Hendon	1½	S.E.
								Edgware (G.N.R.) 2 miles	Charing Cross	9	S.E.
								Golder's Green (Tube) 2 miles			
*Hinton Admiral (Hi'cliffe)	50	44	15N	1	40	40W	100	Hinton Admiral (L. & S.W.R.) 1½ miles	Bournemouth	9	W. by S.
								Christchurch (L. & S.W.R.) 4 miles	Christchurch	4	W.
Southport (Sands)	53	40	0N	3	0	0W	—	Hesketh Par (L. & Y.R.) 1 mile	Southport	½	S.W.
†Yeovil	50	56	20N	2	40	5W	122	Yeovil (L. & S.W.R. and G.W.R.) ½ mile	Yeovil	½	E.

* No accommodation available at present. † Licensed for all but largest types.

(B) CIVIL AERODROMES THE LICENCES OF WHICH WERE STILL IN FORCE ON JULY 1ST, 1920, AND WHICH ARE LICENSED AS "SUITABLE FOR AVRO 504K AND SIMILAR TYPES OF AIRCRAFT ONLY."

Except in very few instances accommodation does not exist. The licences have also been issued for limited periods only. Foreshore aerodromes not included

Aylestone Lane, Leicester	52	36	30N	1	10	0W	200	Leicester (G.C.R.) 2½ miles	Leicester	2½	N.N.E.
Baldridge Farm, Dunf'mline	56	5	0N	3	28	30W	440	Dunfermline (N.B.R.) ¾ mile	Dunfermline	½	S.S.E.
Bidston	53	25	0N	3	4	50W	20	Bidston (Wirral Rly.) ¼ mile	Birkenhead	3½	S.S.E.
Billesley	52	25	0N	1	54	0W	500	King's Heath (G.W.R.) 2 miles	Birmingham	4	N.N.W.
								Hall Green (G.W.R.) 1 mile			
Blythe Bridge, Longton	52	58	0N	2	6	30W	750	Blythe Bridge (N. Staffs. Rly) 1 mile	Stoke-on-Trent	3	N.W.
Botcherby, Carlisle	54	53	30N	2	54	0W	90	Citadel (L. & N.W.R.) 1 mile	Carlisle	1	W.
								Carlisle			
Brean Down, Weston/Mare	51	15	0N	3	0	0W	10	Bleadon (G.W.R.) 2 miles	Weston-super-Mare	2	N.N.E.
Chessington, Leatherhead	51	20	0N	0	19	30W	190	Leatherhead (L.B. & S.C.R.) 2½ miles	Epsom	3	E.
Craigentinny	55	57	30N	3	8	0W	50	Portobello (N.B.R.) 1 mile	Edinburgh	2	W.
Ettrick Bay	55	51	0N	5	8	0W	30	Rothesay Pier (Rly. Boat Ser.) 6 miles	Rothesay, Bute	5	S.E.
Fenny Stratford	52	0	0N	0	43	0W	220	Bletchley (L. & N.W.R.) 1½ miles	Fenny Stratford	½	S.W.

Aerodrome or Seaplane Station. Name	Lat. deg.	Lat. m.	Lat. s.	Long deg.	Long m.	Long s.	Ht. above sea-level. ft.	Nearest Railway Station.	Nearest Town. Name.	Dist. from Aerod'e miles	True bearing from Aerod'e
Forthbank, Alloa	56	6	0N	3	47	0W	20	Alloa (NoB.R.) 1 mile	Alloa	1	N.
Gleneagles	56	15	30N	3	44	0W	500	Gleneagles (Cal. Rly.) ½ mile	Perth	12	N.E.
Kirn, Dunoon	55	57	30N	4	55	0W	140	Kirn Pier (Rly. Boat Service) ¼ mile	Dunoon	½	S.
Lochs Common, Porthcawl	51	29	0N	3	43	0W	70	Porthcawl (G.W.R.) ½ mile	Bridgend	7	N.E byE.
Lodmoor, Weymouth	50	38	0N	2	26	0W	30	Weymouth (G.W.R.) 2 miles	Weymouth	2	S.W.
Macclesfield, Congleton Rd.	53	14	30N	2	8	30W	530	Macclesfield (North Staffs Rly.) 1½ miles	Macclesfield	1½	N.E.
Northampton, Mill Road	52	14	0N	0	54	30W	190	Northampton (L. & N.W.R.) ½ mile	Northampton	½	N.E.
North Berwick	56	3	30N	2	44	0W	100	North Berwick (N.B.R.) 250 yards	North Berwick	¼	E.
North Stoke, Bath	51	25	0N	2	23	0W	750	Bath (G.W.R.) 3 miles	Bath	3	S.E.
Polo Ground, Troon	55	32	30N	4	39	0W	30	Troon Junction (G. & S.W.R.) ½ mile	Troon	½	N.W.
Shoreham	50	47	0N	0	28	0W	20	Bungalow Town Halt (L.B. & S.C.R. 200 yards	Brighton	6	E.
									Worthing	3	W.S.W.
Skegness	53	8	0N	0	20	0E	15	Skegness (G.N.R.) ½ mile	Skegness	½	N.N.E.
Trent Lane, Nottingham	52	56	30N	1	7	30W	80	Nottingham (M.R.) ½ mile	Nottingham	½	N.W.
Uckington (Cheltenham)	51	55	0N	2	6	30W	100	Cheltenham (G.W.R.) 2 miles	Cheltenham	2	S.E.
Wrexham	53	3	0N	3	0	0W	290	Wrexham (G.C.R. and G.W.R.) ½ mile	Wrexham	½	S.S.E.
St. Anne's-on-Sea	53	46	0N	3	1	0W	30	St. Annes-on-Sea (L. & Y. and L. & N.W.R.) 1 mile	Blackpool	3	N.N.W.
Bury St. Edmunds	52	14	30N	0	45	0E	200	Bury St. Edmunds (G.E.R.) 1½ miles	Bury St. Edmunds	1	W.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
July 26th	A.T. & T.	DH9	G-EAQL	London	Paris	05.30	10.30	Papers	Nil	Bamber
	A.T. & T.	DH16	G-EAPT	London	Paris	10.10	16.20	Gds& M.	1	Tebbitt
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10.20	12.50	Goods	Nil	Holmes
	I.A.L.	"Vimy"	G-EASI	London	Paris	12.35	15.35	Nil	6	Barnard
	A.T. & T.	DH9	G-EAQP	Amsterdam	London	16.42	19.09	Gds& M.	1	Reeve
	A.T. & T.	DH16	G-EASW	Paris	London	13.45	19.40	Nil	Nil	Game
						25th				
July 27th	A.T. & T.	DH16	G-EASW	London	Paris	11.30	13.45	Nil	4	Bradley
	A.T. & T.	DH9	G-EAQP	London	Paris	11.30	13.55	Gds& M	Nil	Milnes
	A.T. & T.	DH16	G-EAPT	London	Paris	16.58	19.15	Gds& M.	2	Lines
	A.T. & T.	DH9	G-EAQL	London	Amsterdam	17.02	20.07	Goods	Nil	Forson
	A.T. & T.	DH9	G-EAQL	Paris	London	16.30	11.05	Nil	2	Bamber
						26th				
	A.T. & T.	DH16	G-EAPT	Paris	London	09.45	12.30	Nil	4	Tebbitt
	Private	Sopwith	F-ABCG	Paris	London	10.30	15.54	Nil	1	Jarnach
	I.A.L.	"Vimy"	G-EASI	Paris	London	14.50	10.10	Goods	3	Barnard
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	15.05	17.27	Mail	Nil	Holmes
	A.T. & T.	DH16	G-EASW	Paris	London	16.40	19.10	Nil	4	Bradley
	A.T. & T.	DH9	G-EAQP	Paris	London	17.01	19.37	Goods	Nil	Milnes
July 28th	A.T. & T.	DH16	G-EASW	London	Paris	09.35	12.00	Mail	3	Armstrong
	A.T. & T.	DH9	G-EAQP	London	Amsterdam	10.11	12.55	Goods	1	Reeve
	A.T. & T.	DH16	G-EAPT	London	Paris	16.47	20.15	Mail	3	Game
	A.T. & T.	DH16	G-EAPT	Paris	London	09.50	12.40	Nil	4	Lines
	A.T. & T.	DH9	G-EAQL	Amsterdam	London	15.38	19.00	Gds&M.	Nil	Forson
	A.T. & T.	DH16	G-EASW	Paris	London	16.40	19.08	Nil	1	Armstrong
July 29th	A.T. & T.	DH9	G-EAQL	London	Paris	09.00	11.00	Nil	2	Holmes
	A.T. & T.	DH16	G-EASW	London	Paris	09.40	12.20	Gds&M.	3	Tebbitt
	C.T.	Nieuport	F-ICGT	London	Paris	11.15	14.40	Nil	Nil	Hanin
	I.A.L.	"Vimy"	G-EASI	London	Paris	12.24	14.55	Nil	12	Barnard
	A.T. & T.	DH16	G-EALM	London	Amsterdam	17.15	–	Goods	Nil	Lines
	A.T. & T.	DH16	G-EAPT	London	Paris	17.19	19.30	Mail	4	Powell
	A.T. & T.	DH9	G-EAPL	London	Paris	17.20	19.30	Goods	Nil	Carter
	C.T.	Nieuport	F-ICGT	Paris	London	13.37	08.35	Mail	Nil	Hanin
						28th				
	A.T. & T.	DH16	G-EAPT	Paris	London	09.50	12.24	Goods	2	Game
	C. des G.E.A.	Goliath	F-HMFU	Paris	London	11.25	15.50	Goods	1	Patin
	H.P. & M.A	Spad	F-CMAV	Paris	London	12.15	14.45	Gds&M.	Nil	Bourdon
	A.T. & T.	DH9	G-EAQP	Amsterdam	London	15.10	17.50	Gds&M.	1	Reeve
	A.T. & T.	DH16	G-EASW	Paris	London	16.45	19.25	Nil	4	Tebbitt
	A.T. & T.	DH9	G-EAQL	Paris	London	16.55	19.40	Nil	2	Holmes
July 30th	Owing to bad	weather ma	chines which	started from	either end	failed to	get thr	ough.		
July 31st	C. des G.E.A.	Goliath	F-HMFU	London	Paris	11.10	14.30	Goods	1	Patin
	A.T. & T.	DH9	G-EAQL	London	Paris	11.15	13.45	Gds&M.	1	Bamber
	H.P. & M.A	Spad	F-CMAV	London	Paris	11.28	13.40	Nil	1	Bourdon
	Private	Sopwith	F-ABCG	London	Paris	11.45	19.29	Nil	1	Jarnach
	A.T. & T.	DH9	G-EAQP	London	Paris	12.00	14.20	Nil	2	Game
	A.T. & T.	DH16	G-EASW	London	Amsterdam	13.15	16.15	Nil	2	Game
	A.T. & T.	DH16	G-EAPT	London	Paris	15.35	18.00	Goods	3	Tebbitt
	I.A.L.	"Vimy"	G-EASI	Paris	London	14.35	12.50	Nil	8	Barnard
						30th				
	A.T. & T.	DH16	G-EAPT	Paris	London	11.50	12.47	Nil	4	Powell
						30th				
	H.P. & M.A.	Breguet	F-CMAB	Paris	London	12.45	15.25	Nil	3	Martel
	H.P. & M.A.	Breguet	F-CMAC	Paris	London	12.50	15.26	Gds&M.	1	Challaux
	C. des G.E.A.	Farman 50	F-GEAV	Paris	London	14.20	17.35	Goods	3	Labouchère
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.16	18.06	Gds&M.	1	Lines
	A.T. & T.	DH9	G-EAQP	Paris	London	16.20	19.07	Goods	Nil	Game
August 1st	A.T. & T.	DH18	G-EARI	London	Paris	10.35	12.45	Goods	5	Powell
	C. des G.E.A.	Farman 50	F-GEAV	London	Paris	10.35	13.30	Nil	3	Labouchère
	A.T. & T.	DH16	G-EALU	Paris	London	13.10	15.35	Goods	1	Baylis
	A.T. & T.	DH16	G-EAPT	Paris	London	—	13.00	Nil	2	Tebbitt

On July 30th machines attempted each end of route to leave, but all returned or landed owing to bad weather rendering flying impossible. Where machines have been delayed a day, it is owing to bad weather.

1 in 7 Hill Climb won on Shell Aviation

MOTOR SPIRIT DE LUXE

Mr. E. Smith (of Cedos Motors, Northampton), in a Hill Climb competition held at Roddington recently, won the 350 class on a 2½ h.p. Cedos, on Shell Aviation Motor Spirit.

SHELL

EVERY CAN SEALED

128

ONLY THE BEST

CAN GIVE

THE BEST RESULTS

Good Workmanship and our Superfine Aero Varnishes, Paints and Enamels will ensure a Perfect Finish.

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VARNISHES, PAINTS & ENAMELS
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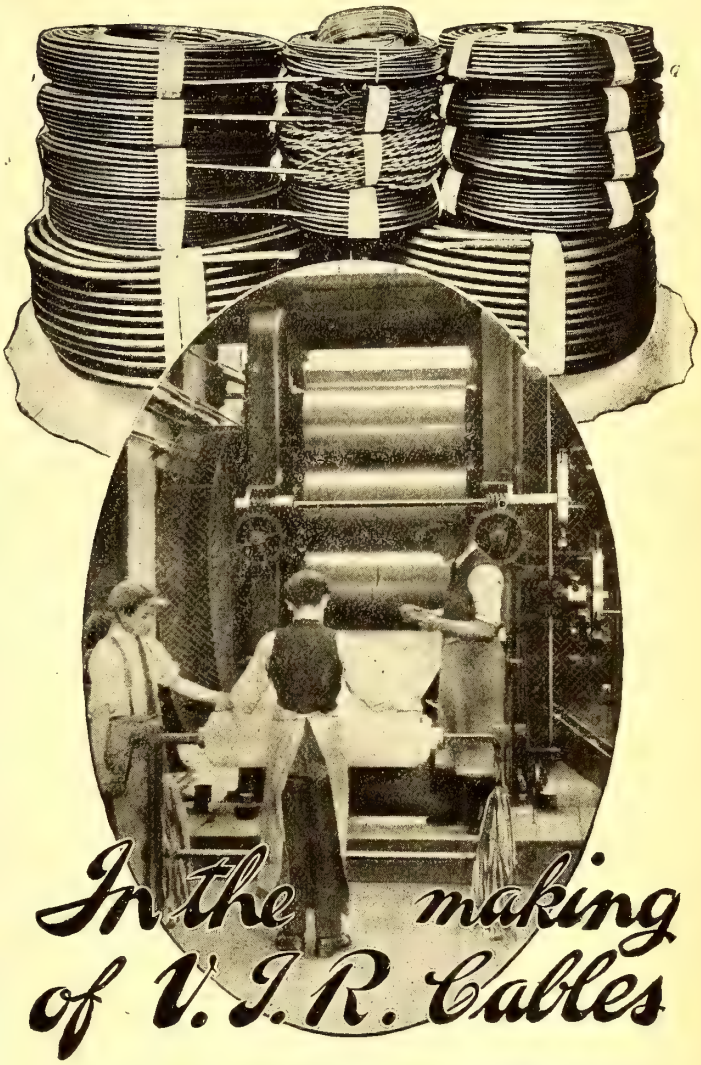

In the making of V.I.R. Cables

the C.M.A. standard to which we and our fellow members work ensures a general high level of quality which must be all to the advantage of the user. But we claim for J. & P. CABLES just a little more—a super-excellence founded on an experience of 45 years in cable engineering, and on a confirmed adhesion during the whole of that period to the policy of "Quality first."

Just to remind you how much room for experience there is we propose to illustrate in this and succeeding issues a few of the processes employed in the manufacture of a V.I.R. Cable.

Above we show one of our battery of Rubber Calendering Machines in which the Rubber is rolled down between steam-heated rollers into a sheet of the required thickness, and within limits as fine as 1/1000th of an inch. This sheet is afterwards applied to the wires and cables, and later we will illustrate the plant employed to effect that application.

In the meantime remember we can deliver these cables from stock at Works and Branches.

JOHNSON & PHILLIPS LTD.,
CHARLTON, LONDON, S.E.7.

City Office: 12, *Union Court, Old Broad Street, E.C.2.*

BRANCHES:

BIRMINGHAM—206, Corporation St.	*Telephone:*	*Central 7321.*
CARDIFF—2a, Court Road.	,,	*Cardiff 1937.*
GLASGOW—159, West George Street.	,,	*Central 8391.*
MANCHESTER—251, Deansgate.	,,	*Central 4174.*
NEWCASTLE-ON-TYNE—44b, Blackett Street.	,,	*Central 1691.*
PORTSMOUTH—Cleveland Road, Gosport.	,,	*Portsmouth 4354.*
SWANSEA—12, Heathfield Street.	,,	*Docks 620.*

The Air Port of Cricklewood.

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No. of Passengers.	Pilot
July 26th	H.P. & M.A.	Hand'y Page	G-EATG	London	Paris	12.12	15.35	Goods	4	
	H.P. & M.A.	Hand'y Page	G-EATK	London	Brussels	15.00	17.30	Gds&M.	—	
	H.P. & M.A.	DH9	G-EAUI	London	Amsterdam	16.10	—	Gds&M.	1	
	H.P. & M.A.	DH9	G-EATA	Amsterdam	London	—	17.05	—	—	
	H.P. & M.A.	Hand'y Page	G-EATG	Paris	London	17.40	22.00	—	8	
July 27th	H.P. & M.A.	Martinsyde	G-EAGH	London	Antwerp	10.50	Landed Calais	—	—	
	H.P. & M.A.	Hand'y Page	G-EATH	London	Paris	10.55	13.55	—	—	
	H.P. & M.A.	Hand'y Page	G-EASM	London	Paris	12.25	15.40	Goods	4	
	H.P. & M.A.	Hand'y Page	G-EATN	London	Brussels	14.55	18.00	Mail	—	
	H.P. & M.A.	Hand'y Page	G-EATK	Brussels	London	15.00	18.20	Mail	—	
July 28th	H.P. & M.A.	Hand'y Page	G-EATH	Paris	London	10.30	14.35	—	—	
	H.P. & M.A.	Hand'y Page	G-EASY	London	Paris	12.12	15.30	Goods	10	
	H.P. & M.A.	DH9	G-EAUH	Amsterdam	London	11.23	14.45	—	—	
	H.P. & M.A.	Hand'y Page	G-EASL	Paris	London	14.20	18.15	Goods	6	
	H.P. & M.A.	DH9	G-EATA	London	Brussels	15.12	08.35 29th	Mail	1	
	H.P. & M.A.	Hand'y Page	G-EATN	Brussels	London	15.00	10.15 29th Delayed Lympne	Mail	—	
July 29th	H.P. & M.A.	Hand'y Page	G-EASY	Paris	London	12.25	16.15	Goods	2	
	H.P. & M.A.	Hand'y Page	G-EATM	London	Paris	12.15	15.10	—	—	
	H.P. & M.A.	DH9	G-EAUI	London	Brussels	14.50	17.10	Mail	1	
	H.P. & M.A.	Hand'y Page	G-EATG	London	Paris	17.55	21.15	—	4	
	H.P. & M.A.	DH9	G-EATA	Brussels	London	15.15	18.35	Gds&M	2	
July 30th	H.P. & M.A.	Hand'y Page	G-EATG	Paris	London	13.10	18.35	Goods	1	
	H.P. & M.A.	Hand'y Page	G-EATM	—	—	—	19.45	—	—	
July 31st	H.P. & M.A.	Hand'y Page	G-EATK	London	Paris	10.25	—	Goods	8	
	H.P. & M.A.	DH9	G-EATA	London	Paris	10.50	—	—	2	
	H.P. & M.A.	Hand'y Page	G-EATJ	London	Paris	12.15	—	Goods	8	
August 1st	H.P. & M.A.	Hand'y Page	G-EASL	Brussels	London	—	18.30	—	—	

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; H.P. & M.A.—Handley Page and Messageries Aeriennes. I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company, M.W.T.C.—Marconi Wireless Telegraph Company.
Where times are missing it is probably owing to Atmospherics affecting signals.

Inland Flying at Croydon.

July 26th.—Nil.

July 27th.—Private: Milnes and Jones, 1 Avro from Manchester.

July 28th.—A.T. and T., Ltd., 1 D.H.9, Bournemouth return.

July 29.—A.T. and T., Ltd., D.H.16, 4 tests; D.H.9, 4 joy-rides; Milnes and Jones, 1 Avro to Manchester.

July 30th.—Nil.

July 31st.—A.T. and T., Ltd., D.H.9, test; D.H.18, from Hendon; D.H.16 and two D.H.9s. from Lympne; I.A.L., Vickers-Vimy, joy-ride.

August 1st.—A.T. and T., Ltd., D.H.16, 4 tests; D.H.9, 1 test; I.A.L., Vickers-Vimy, 2 joy-rides.

The London Terminal Aerodrome.

Now that Trust Houses, Ltd., have got their dining room and lounge into something like comfort Croydon Aerodrome is a most pleasant place even on a wet day, when it is by no means so dry as its Air Force opposite number appears to be.

The Instone Air Line was again taking joy-rides in the Vimy during the week-end. Among the passengers were the winner of a free flight ticket, and the youngest member of the Gaiety Theatre company. The Vimy had been over to Paris with a full load of passengers, some of whom were rather what has been termed "oversize." It is lucky that the Vimy has a large front door.

A new French 4-seater Farman arrived during the week, and an Avro belonging to Messrs. Milnes and Jones appeared. Owing to the appalling weather of the past week, it is a wonder there was any flying at all. One hears of a captive balloon at the Crystal Palace which is, of course, visible from the Aerodrome. One hopes that there are no absent-minded erstwhile balloon strafers on the air line.—G. D.

The Air Port of Cricklewood.

In the Handley Page Bulletin for the week ending July 31st it is stated that "amongst the freight recently conveyed by the Handley Page Royal Mail Air Service to Amsterdam was an engine weighing nearly a quarter of a ton. This is the first instance of machinery being conveyed by air to Holland."

Can the writer of this have forgotten that a B.A.T. "F.K.26" carried a spare A.B.C. engine to Amsterdam for the E.L.T.A. a year ago?—G. D.

More Conjuring Tricks by the Department of Information.

According to Arrivals and Departures table No. 102 issued by the Department of Information, a Handley Page G-EASV, which left Paris for Cricklewood at 10.30 on the 7th ult., besides *flying* to Cricklewood where it arrived at 16.15, not only succeeded in altering its markings to G-EASY, but it also turned itself into a Bristol. Experts in the construction of aeroplanes will agree that this is no mean feat.—G.D.

Not an Advertisement for "Sargol."

A paragraph from the Handley Page Bulletin for the week ending July 3rd, 1920, is headed "Passengers expand with the traffic." This does not mean that on entering an Handley Page machine passengers were fed on "Sargol" and became so fat that they were unable to leave the aeroplane and so were kept in the clutches of the Company for ever. It merely records the fact that as more people use the service, the corpulent as well as the lean are naturally included, and some difficulty has been found when trying to include the former in standard-size flying kit.

One was recently told that the Company will deal with meals, including ice-cream, on journeys.

Bournemouth.

In spite of the weather the Bournemouth Aviation Co. has been doing a fair amount of work recently.

Dozens of passengers were carried at Weymouth last week and crowds have witnessed the flying. Several people had as many as three and four flights each during the course of an afternoon, and people of all classes, among whom were an Earl, a deep-sea diver, a sand artist, and several sailors belonging to the submarine service, were taken up.

Two machines were to have been sent to the Agricultural Show at Aston Park, near Bristol, on Bank Holiday, and the machines were also to go to the company's aerodrome at Bath for passenger-flying on August 4th.

The training machines have also been kept very busy, and two pupils, a Mr. Bailey and a Mr. Lindsay, were passed out on Avros last week under the tuition of Mr. Tollerfield, the firm's chief pilot.

Scarborough.

A great deal of flying has been done in Scarborough by Captain John Oliver, late R.F.C. and R.A.F., who has been flying an Avro belonging to the Border Aviation Company. There seems to be any amount of enthusiasm over aviation among the holiday visitors at Scarborough, and the firm's machine has been so hard worked that it has been necessary to buy another machine with which to carry on while the other is being overhauled.

The Border Aviation Company was founded early this year at Carlisle by Messrs. Ingham, Roberts, Barling and Little. Mr. Ingham learned to fly at the Lakes Flying Company's school at Windermere. The firm started business at Carlisle, but at first was not very successful. On June 23rd Captain Oliver took the machine to Scarborough and since then, as

already stated, business has been excellent. The machine is a genuine Avro, built by the Avro Company, and was overhauled by the firm two or three months ago before being put onto regular passenger work. The engine is a 110 h.p. Le Rhône, built by the Le Rhône Company itself, and it, like the machine, has done wonderful service, in fact, nothing has had to be changed in the engine except one plug since it began this work. Captain Oliver, the pilot, was trained at Gosport, and was afterwards an instructor at the Central Flying School where he assisted in carrying out the tests with the first dual control Sopwith "Camel." He owned a Deperdussin monoplane and a Blériot monoplane a year or so before the war while still quite a youth, and he was actually serving his time in the Avro works at Manchester at the outbreak of war, so that both as a pilot and as a practical mechanic he has very considerable experience behind him. Altogether the way in which the Border Aviation Company is conducting its business is such as to inspire confidence in would-be passengers and to assist in the general progress of aviation.

Woking.

Martinsyde, Ltd., have recently received the remains of the Rolls-Royce "Falcon" engine which was fitted to their machine on which the late Capt. Howell attempted to fly to Australia. The engine has suffered severely from immersion in the sea, and the salt water has reduced the cylinders to a shapeless mass, the external fittings being almost indistinguishable from the cylinder heads, while the crankcase is also very badly corroded. The engine is quite irreparably damaged, and is only of use as a souvenir or a study in the effects on metals of long immersion in salt water.

One is continually hearing rumours of another Martinsyde speed machine being built, to be much faster than the "Semiquaver," with a 450 h.p. Napier "Lion" engine.—J. F. S.

THE BRITISH DOMINIONS BEYOND THE SEAS.

MESOPOTAMIA.

A correspondent in Mesopotamia, who is keenly interested in aviation, writes saying that Sir Arnold Talbot Wilson, K.C.M.G., the Civil Commissioner at Baghdad, is keenly interested in the possibilities of Civil Aviation in Mesopotamia.

Sir Arnold Wilson himself habitually travels by air between Baghdad and Basrah and has also made the Baghdad-Cairo trip on several occasions by aeroplane. This should be encouraging to those who are thinking of developing Civil Aviation in Mesopotamia.

EGYPT.

The Egyptian Conspiracy Case

Mr. E. A. Mitchell-Innes, K.C., and Mr. Walter Hedley, counsel for the defence in the Cairo conspiracy case, flew from London to Marseilles on July 29th on their way to Cairo.

NEW ZEALAND.

Variable Camber.

The *Otago Daily Times* states that Mr Humphrey F. Parker's variable camber wing patent has been officially taken up by the United States Government. Mr. Parker is a young New Zealander, and his invention should decrease the dangers of flying materially.

Mr. Parker proceeded from Dunedin, New Zealand, to Washington, U.S.A., in May, 1918, and the authorities there speedily recognised the potentialities of his patent, with the result that a series of the most exhaustive tests was made at the American Bureau of Standards under the direction of the National Advisory Committee for Aeronautics, with extremely satisfactory results. The tests were carried out under the personal supervision of the inventor, who was appointed to the staff at the Bureau of Standards, where he has been continuously engaged not only on work connected with his own invention, but on other important Government work as well.

A company was formed in New Zealand and registered on June 21st to develop the commercial side of the invention. The capital of the company was fully subscribed from the outset and registration was effected under the name of the Parker Aeroplane Improvement Company. This company controls the patent rights of the invention, and negotiations have already been opened up with a strong financial syndicate for the handling of the invention in England.

Prior to proceeding to England in 1915 to offer his services to the British Air Authorities, Mr. Parker was an engineering student at Canterbury College. As indicated, he is still engaged in Washington at the Bureau of Standards on most important work for the U.S.A. Government.

This work will be finished shortly and Mr. Parker will probably proceed to England for the purpose of supervising the construction of an aeroplane embodying the invention.

SOUTH AFRICA.

Marconi Wireless Telephone Demonstrations.

Under the direction of two engineers of Marconi's Wireless Telegraph Co., Ltd., and under the auspices of the Wireless Agency, Ltd., of Capetown, who are the Marconi representatives in South Africa, a demonstration of wireless telephony has been carried out; and in addition to the ordinary ground conversation, etc., an Avro belonging to the South African Aerial Transports, Ltd., was fitted up, and communication was effectively maintained with the ground set at Baragwanath aerodrome.

An additional aerial has been installed above the offices of the Johannesburg *Star*, from which the set can be operated under what may be called town conditions. At the same time it should be possible to keep in touch with the field set at Baragwanath.

The tests carried out by Mr. Poyntz of the Marconi Co., with Captain Ross, D.F.C., as pilot, were very successful. Subsequently, Sir H. Lauder and a representative of the *Star* went up and aired their views wirelessly, and even sang!

FOREIGN INTELLIGENCE.

BELGIUM.

Aviation During the Olympic Games.

A "Seaplane Meeting" was carried out from July 17th to 29th by the authorities at Antwerp contemporaneously with the Olympic Games, though not as part of them. The only two British machines there were the Vickers "Viking" and Flight-Lieut. Charles Scott's "F.3" flying boat.

After some duration "flights" (in balloons) of varying lengths on July 18th, the famous French aviator Nungesser arrived "by way of the air" to participate in the meeting. He was applauded "*chaleureusement.*"

On July 19th "the Inter-Allied Military representatives disputed with success before the Belgian Ministry of National Defence." This was not, as one might think, a practice for more week-end conferences between Premiers, the next of which is reported to be about to take place at the Metropole, Brighton, but merely a camera-machine-gun duel between machines of various countries, limited to five minutes. The various countries in this case were France and Belgium, as none of the other Allies seem to have been interested, Great Britain, Siam, Portugal, and others of the 22 conquerors of Germany being unrepresented.

In this contest the Belgian aviators secured a large number of victories, probably the first they can claim since the outbreak of war. Of course, in the latter phases of this war they were handicapped by lack of equipment, a reckless aviator having taken up the aircraft of the Belgian Flying Corps for a test and crashed it.

After an "*atterrissage*" competition for "*spheriques,*" M. Nungesser, who did not belong to the French team, issued a "defy."

In the "concourse of virtuosity and address" on July 20th, M. Fronval was first on a Morane.

When M. van Cottem responded to Nungesser's "defy" a "jury" was impanelled. Whether this body was to judge the result of the "defy," or merely to save time in case an inquest was necessary in the end, is not stated. An "*acclamation formidable*" greeted M. Nungesser's victory.

The "Seance de l'A.F.A." (which stands for "Aeronautique Federation Anversois," or words to that effect) has been extended to the first days in August. Lieut. van Cottem "launched a defy" to his victor of July 20th, for a "*concours d'acrobaties aériennes et un simulacre de combat.*"

In the "*concours de vitesse*" for "*monoplaces*" over a course of 240 miles, M. Sadi Lecointe was first on a Nieuport. Two avions of the Compagnie Franco-Roumaine, a French company but slightly Roumanian in which M. Henri Potez is the moving spirit, arrived on July 23rd. This company announced that their "*titular avion*" made the trip from Paris in 1 hr. 40 min. The Belgian "as" Thieffry has now "defied" Nungesser. Someone will be getting hurt soon.

On July 24th Stoppani the Italian won the "*vitesse*" competition for "*biplaces.*" Our old friend George won the "10 place" *vitesse* race on a Goliath!!!

It was reported in the *Telegraph* on July 30th that in the 600 km. *seaplane* race on the previous day a "Handley Page" with "Major" Scott as pilot was first, with Capt. Cockerell second on a Vickers "Vimy." There were no other competitors.

These machines were apparently the "F.3" and "Viking," to which reference was made above.—G. D.

The Italian correspondent of THE AEROPLANE writes :—

Stoppani, who upheld the Italian colours very ably in the recent Speed Race at Antwerp, was flying a machine built by the Ansaldo Company and styled A.300/2. It is powered by the well-tried FIAT A.12 bis motor, called a 300 h.p., and Stoppani had flown her up from Turin with a passenger the afternoon before.—T. S. H.

BRAZIL.

In "A Report on the General Economic and Financial Conditions of Brazil for the Year 1919, by Mr. E. Hambloch, Commercial Secretary to H.M. Embassy, Rio de Janeiro, issued as a White Paper [Cmd. 840] by the Department of Overseas Trade, Board of Trade," the following reference is made to aviation in Brazil :—

Commercial Aviation.

There is no real progress to be noted under this heading.

The Brazilian Army and Navy have various French, Italian and American machines.

The Aero Club Brazileiro has been formed, but so far no flying is done except in the Army and the Navy.

British aircraft manufacturers have been considering the possibilities of commercial aviation and have sent representatives and experts to Brazil. There seems every possibility of an aerial postal and passenger service being inaugurated very soon between Pernambuco and Buenos Aires, *via* Rio de Janeiro and other intermediate towns of importance.

GERMANY.

The Activities of the Zeppelin Firm.

Herr Colsmann, the director-general of the Zeppelin Company, recently returned from the United States, where he had been negotiating with certain firms with regard to Transatlantic air traffic.

The company is also in negotiation with Holland, Sweden, and the United States for the construction of airships on an international basis.

It is rumoured that a new type Zeppelin airship, with a load capacity of 60 tons, accommodation for 500 passengers and fuel capacity for a voyage three times the length of the Atlantic crossing, is to be evolved.

HOLLAND.

The Danish correspondent of The Aeroplane writes :—

A Dutch Company.

A regular advertiser in the German aero journal *The Flying World* is a Dutch enterprise "Ilvo" (N.V. Internationale Lucht-Vervoer-Onderneming) in Amsterdam, 761 Prinsengracht. The firm announces that it has aerodromes in Leeuwarden, Groningen, Deventers, Hertogenbosch and Haag, that it arranges competitions and passenger flights and seeks air-line junction with German aerial navigation companies.

Aerial Transport Work.

The forwarding agents Defais and Verschure advertise in Rotterdam papers to the effect that they undertake aerial transport work to England, charging a single fare of 150 fl. per person and 1.8 fl. per kg. goods

A Concession.

Concerning the placing of the Army aerodrome at Schiphol at the disposal of civil aeroplanes arriving from or leaving for abroad, the army authorities have received orders to afford all possible assistance for the transport of passengers in army motor-cars at a cost of 45 cents. per km., also of goods, for which the tariff has, however, not been fixed so far.—E. H.

A Correction.

The D.H.9, which crashed near Rotterdam recently, did not belong to A.T. and T., as was erroneously reported, but was one of the D.H. type machines used on the H.P. and M.A. Air Line. One is told that a terrific rain storm was in full working order at the time.

SWEDEN.

A Drop from an Aeroplane in a Gale.

The following communiqué has been received from E. R. Calthrop's Aerial Patents, Ltd. Its style and form might well be copied by others who send communications in regard to the performance of their wares :—

By way of celebrating his fiftieth parachute descent, Major Orde Lees made a drop from an aeroplane under very exceptional conditions in the presence of the Royal Swedish Fleet at Borgholm, in Sweden, on July 20th.

A gale of wind blowing at forty to fifty miles an hour was raging.

The sea was very rough.

To the surprise of everyone an aeroplane of the P.O. Flygkompani piloted by the British aviator, Captain K. Saunders, D.S.O., A.F.C., appeared over the town, battled against the gale, and made its way very slowly towards the fleet.

When exactly over the flagship of Commodore Starck and at a height of 1,500 feet, the parachutist was seen to dive from the aeroplane.

During its minute and a half of descent the parachute drifted towards the shore at express speed, but deposited its burden in the waves about three-quarters of a mile from the harbour.

The most exciting part of the whole experiment was yet to come. No sooner was Major Lees in the water than the wind caught the parachute which commenced towing its passenger at the speed of a torpedo through the water. Only by turning on his back is it possible for a swimmer to be towed at such speed.

From points of vantage it appeared as if the swimmer was wholly under water for considerable periods.

It was Major Orde Lee's special request that no boats should be sent to the rescue unless he gave a distress signal.

Commodore Starck, however, fearing that all might not be so well as it looked, set off in his steam pinnace and overtook the parachutist just as he was about to enter the mouth of the harbour still towed by his unique form of sail.

By skilful manipulation the swimmer, declining respectfully the Commodore's kindly aid, steered his queer craft not only into the harbour, but berthed himself successfully alongside the steamer jetty.

The distance run was three-quarters of a mile at an average speed of six and a half (at first well over ten) miles an hour.

UNITED STATES OF AMERICA.

The Wright Patents Injunction.

The following communiqué has been issued by the Manufacturers' Aircraft Association, New York, on the authority of the Wright Aeronautical Corporation :—

"Recently published newspaper articles concerning the suit of the Wright Aeronautical Corporation, owner of the basic Wright airplane patents, against the Interallied Aircraft Corporation, have resulted in misunderstanding as to the right of the Interallied Aircraft to sell its Avro and Sopwith airplanes. The Final Decree of the Court in that suit did prohibit the further sale or use of these airplanes, but the Interallied Aircraft Corporation has made an agreement with the Wright Aeronautical Corporation so that all the planes which the Interallied Aircraft now has and is selling are licensed under the Wright patent, and the Interallied Aircraft has the absolute right to sell them.

"No purchaser or user of the airplanes sold by the Interallied Aircraft has any reason to apprehend any legal difficulties with respect to the Wright patent. Purchasers or users of unlicensed foreign airplanes do run the danger of becoming involved in expensive patent litigation, but the planes of the Interallied Aircraft are guaranteed licensed under the basis Wright patent."

The Gordon Bennett Cup Race.

The Aero Club of America announced on July 19th that the following machines have been selected to represent the United States in the Gordon Bennett Cup Race to be flown in France during the week beginning Sept. 27th : (i) United States Army Aeroplane type not stated ; pilot, Major R. W. Schroeder; (ii) Aero Club of Texas, Curtiss aeroplane, pilot not stated; (iii) Dayton-Wright Division of General Motors, type not stated, pilot not stated.

American-Built Zeppelins?

It is reported that German agents in the United States are trying to secure financial assistance for the purchase of the Zeppelin patent rights in that country in order that Zeppelin airships may be constructed in the States. Mr. Henry Ford and the President of the Goodyear Company (Mr. S. A. Seiterling) are each considering proposals in this matter.

This arrangement might prove of advantage to the Zeppelin firm, as under the terms of the Treaty of Versailles the construction even of commercial aircraft in Germany is not encouraged. The U.S. Government appear to be unwilling to purchase foreign-built aircraft, and would probably welcome the construction of rigid airships of foreign design in the United States, as the nucleus for a native industry.

The German agents are willing to build an 80-ton airship at cost price to prove its practical uses that financiers might be encouraged to give the necessary assistance in money.

A Sardine Search by Aeroplane.

About a year ago the sardine canneries of Southern California were inactive owing to the apparent shortage of fish. That the world should not long unavailingly for the compressed corpses of the sardine an agreement was arranged between the Fish and Game Commission and the Naval Air Station at San Diego, under the terms of which naval seaplanes were to search the seas for sardine shoals. When these were found the position was to be sent to San Diego by wireless, thence to the Commission by telephone, that the fishers and the embalmers might each be informed.

The first day's work was very successful, and the fishers were directed to large shoals of their quarry. The canneries, idle for four months, resumed with vigour their accustomed task. The fish reconnaisance proceeds with regularity and success, and happiness has deserted the homes of the Pacific Coast sardines.

The Air Station have had squared charts of the sea area made in order that a shoal region may be transmitted by number. The pilots employed are all greatly impressed by the high visibility of objects below the sea surface.

Mortgages, Charges and Satisfactions.

British Anzani Engine Co., Ltd.—Particulars of £4,000 debs. authorised July 8th, 1920, whole amount issued. Property charged : The company's undertaking and property, present and future, including uncalled capital. No trustees.

NAVAL AND MILITARY AERONAUTICS.

GREAT BRITAIN.

NAVAL.

NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on July 22nd :—

Warrant Shipwright.—F. G. H. Davies, to *Ark Royal*, July 20th.

In the Prize Court.

On July 27th the President, Sir Henry Duke, made an award of £150 to Lieut. W. T. A. Bird, D.S.C., R.N., of H.M.S *Guise*, and Lieut. F. Waring, D.F.C., R.A.F., of H.M. Seaplane 9,983, for the destruction of the German U.C.70 off Kettleness on Aug. 28th, 1918.

MILITARY

WAR OFFICE, July 22nd.

The name of the following has been brought to the notice of the Secretary of State for War for valuable and distinguished services rendered in connection with the military operations in the theatre of war specified, during the period June 1st, 1918, to April 30th, 1919 (to be dated June 3rd, 1919) :—

ADEN FIELD FORCE.—Hartley, 1959 Sjt. C. W., 1st Lrs, attd. R.A.F. (killed in action).

The Mesopotamian Affair.

It is stated by the War Office that on July 21st the garrison of Rumeitha was withdrawn to Imam Hamza. An aeroplane assisted to cover the retreat.

The same communique states that aeroplanes while reconnoitring over Kufah were fired at from the town. The pilots of these aeroplanes reported much movement of and large concentrations of Arabs.

AIR FORCE.

FIRST OPEN COMPETITION FOR BOY MECHANICS (R.A.F.).

The Air Ministry announced on July 30th :—

Under a new scheme which has been established for training Boy Mechanics in the Royal Air Force, an open Competitive Examination for Candidates for entry in January, 1920, will be held by the Civil Service Commissioners on Monday, November 1st, at the undermentioned Centres :—Exeter, Southampton, London, Bristol, Cardiff, Birmingham, Norwich, Manchester, Leeds, Hull, Belfast, Newcastle, Glasgow, Edinburgh, Aberdeen, Dublin.

The examination will include Mathematics, Experimental Science, English Composition and a General Paper. There will be a minimum of 300 vacancies.

Candidates must be the sons of British-born parents, and must be between the ages of 15 and 16½ years on January 1st, 1921

A list of candidates for appointment by Open Competition is kept at the Office of the Civil Service Commissioners and the necessary entry forms can be obtained on application to the Secretary, Civil Service Commission, Burlington House, London, W.1, after August 2nd. The last day on which applications can be accepted is Thursday, Sept. 9th.

Boy Mechanics, Royal Air Force, are attested for 12 years' service from date of entry, made up by 10 years' regular Air Force service and 2 years in the Reserve. They receive three years' preliminary training in one of the skilled Air Force trades, which include those of Carpenter, Coppersmith, Draughtsman, Electrician, Fitter, Instrument Maker, Turner and Machinist, Wireless Operator Mechanic. Throughout the three years' training, 8 hours a week are devoted to an educational course, which will include English (Language, Literature, History, Geography and Civics), practical Mathematics, General Science and Drawing.

Special attention is given also to boys' physical development, nine hours a week being allotted to drill, physical training and organised games. The health and general welfare of the boys are given careful and general supervision during their period of training.

Every candidate for entry should be in good health and of sound constitution. The medical examination, which is necessarily a severe test of fitness, will not be held until immediately after the successful candidate joins the Training Centre. To avoid eventual disappointment, therefore, and delay in proceeding to some other career, in the event of failure, it is most desirable that before a boy comes forward as a candidate for entry, steps should be taken to ascertain whether he is suffering from any physical disability which might prevent his acceptance on medical grounds.

Boy mechanics will be provided with a free outfit, will be lodged and victualled free of cost and will receive pay at the rate of 1s. 6d. a day until the age of 18, when the rate becomes 3s. a day.

Those who complete satisfactorily the course of training will receive immediate promotion to the rank of Leading Aircraftman with pay of 5s. 6d. a day, rising to 6s. 2d a day. Those who do exceptionally well may be selected for an advanced course and immediate promotion to the rank of Corporal with pay of 7s. 9d. a day, rising to 8s. 6d. a day. From this stage there will be opportunities for promotion through the ranks of Sergeant and Flight Sergeant to Warrant Officer, with a maximum rate of pay of 18s. a day. In addition to the rate of pay quoted, airmen (including boys) are granted clothing, free rations, and accommodation, or allowances in lieu. There is also extra pay for good-conduct badges.

From among those boys who complete the advanced course successfully, a few may be selected for Cadetships, and if they accept will be admitted to the Royal Air Force (Cadet) College, where they will take the ordinary course of training as Pilot Officers with the Cadets entered by open competition. There will also be opportunities for promotion to commissioned rank at a later stage to those who prove themselves suitable during their service in the ranks

A pamphlet giving further particulars of the course of training, conditions of service, and systems of entry has been prepared and will shortly be available for issue Application for copies should be made to the Inspector of Recruiting, Royal Air Force, 4, Henrietta Street, Covent Garden, W.C.2.

The Flight of R.33.

On July 29th at 22.15 hours the British airship R.33 left Howden for Antwerp with the Belgian Air Attache on board as a passenger. She reached Antwerp early on the following day and flew over the Olympic Games ground. Without landing she returned to England, passing over London at 19.30 hours on the same day. She reached Howden safely and without incident later in the evening.

R.A.F. Football.

On March 16th, 1921, the Royal Navy will play the Royal Air Force at football on the R.A.F. ground.

FRANCE.

An Aircraft Carrier.

The French cruiser *Bèarn*, now under construction, is being transformed into an aircraft-carrier.

GREECE.

OFFICIAL COMMUNIQUE.

July 21st.— . . Our artillery replied, shelling the enemy positions before Kuleli-Burgas. An aeroplane flew over the enemy positions without remarking any infantry movement and bombed the enemy batteries in action. The bombardment continued until 8.30 p.m. The bridges were undamaged.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

One regrets to have to record the death, through the breaking of a wing on their flying-boat at Spezia, of Naval Lieut. Brunetta, a most able pilot, and his motorist, Zampronio, on July 21st, while flying on delicate and important duty connected with the defence of the Realm.—T. S. H.

UNITED STATES OF AMERICA.

A correspondent in Canada writes :—

Work at McCook Field.

There has been considerable activity at the United States Air Service Aerodrome, known as the McCook Field, during the last few weeks. The most notable of the new machines is the Le Père tripiane, which has been designed solely for war purposes. This machine, which is now due for test, is armoured throughout and is equipped with eight machine-guns of an aerial type and a 37 mm. "quick-firer" somewhat after the style of the "Cow-gun" which will be remembered by those who saw the first D.H.10 in France in 1918. The Le Père is fitted with two 400 h.p. Liberty engines.—L. M.

AIRCRAFT IN PARLIAMENT

HOUSE OF COMMONS.

July 21st.—The following written reply was given :—

ROYAL AIR FORCE (RECRUITS).

Mr. ROBERT YOUNG asked the Secretary of State for Air whether there is a regulation which lays it down that where a recruit has enlisted in the Royal Air Force to follow a certain trade, and he is found inefficient or there is no work at his particular trade, he can claim to be discharged; whether this discharge, if claimed, is free or must be paid for, and, if paid for, what is the cost.

Mr. CHURCHILL : The answer to the first part of the question is in the negative. The second and third parts, therefore, do not arise.

* * *

July 22nd.—The following written answers were given :—

ROYAL AIR FORCE.

POLEGATE AIRSHIP STATION.

Mr. GWYNNE asked the Secretary of State for Air the reason of the delay in releasing the huts at the Polegate airship station for sale; and whether, in view of the fact that accommodation is urgently required in that district, all the existing houses having been occupied for a long time past, and that the men employed by the War Office in the district are being billeted in the neighbourhood, which is aggravating the situation, he will take steps to see that these huts, which are deteriorating by being left empty, are released forthwith?

Mr. CHURCHILL : The huts in question have now been released for sale by the Disposal Board. The party of officers and men employed at Polegate to pack airship stores will be withdrawn in about a fortnight's time, and the billets they are now occupying will then be vacated.

PROMOTIONS.

Mr. R. YOUNG asked the Secretary of State for Air, seeing it is admitted by his Department that promotion lists issued by the Royal Naval Air Service were regarded as authoritative and were used in connection with the adjustment of the pay of the ratings concerned, whether promotion list No. 36 was dated February 1st, 1918; and whether the ratings on that list were duly promoted from the authorised date or whether there was any delay in giving effect to the Order?

Mr. CHURCHILL : I am informed that promotion list No. 36 was dated Feb. 1st, 1918. It was issued on July 2nd, 1918, and was no doubt acted on with the least possible delay, though I am unable to state after this lapse of time whether delay occurred in any particular case. Promotions took effect from February 1st, 1918, with the consequential adjustments of pay I may add that the list was accompanied by instructions making the promotion of riggers (L) conditional upon the existence of vacancies in the authorised establishment, and also prohibiting the promotion of any men on the list who had committed themselves since being recommended. If the hon. Member will supply me with particulars of the case he has in mind I will have inquiries made.

* * *

MESOPOTAMIA.—MILITARY SITUATION.

July 22nd.—At the end of Questions, Mr. CHURCHILL made a statement in regard to the latest developments in Mesopotamia. He said that after the original relief column for Rumeitha was held up, a force composed of approximately one infantry brigade, with artillery, was concentrated at Iman-Hamza. At dawn on the 18th this column moved forward to relieve the garrison at Rumeitha. On the following day a point four miles N.W. of Rumeitha was reached. Strong opposition was encountered here. The enemy were bombed and machine-

gunned with effect by aeroplanes which co-operated with the troops. During the night the enemy evacuated their position and retired to an embankment 1,000 yd to the south. On the 20th the column advanced through the evacuated positions. Parties of the hastily retiring enemy were again bombed and machine-gunned by the aeroplanes. In the afternoon of the 20th the relief column reached Rumeitha.

* * *

July 26th.—The following oral answers were given:—

BRITISH ARMY.—NORTH DULWICH GUN STATION.

Sir F. HALL asked the Secretary of State for War whether he is aware that at North Dulwich gun station there are 12 guns, with one officer and five men to look after them, and that the same are stationed on land belonging to the Dulwich Estate Governors, and which is required for the James Allen's Girl's School; why, after repeated requests that the land might be vacated, the guns are still in the same position; and whether, considering that neither the officer nor the men are carrying out any duties that can have any beneficial effects to the country, he will give instructions forthwith to have the guns removed in order that the land may revert to the use of the Dulwich Estate Governors and the officer and men utilised elsewhere and in a much more effective manner?

Sir A. WILLIAMSON: All the guns, stores and personnel will, it is expected, be withdrawn within a week. The buildings will then be ready for disposal, and arrangements will be made for the land to be given up as soon as the stores, etc., have been removed.

TROOPS IN MESOPOTAMIA AND NORTH-WEST PERSIA.

Lieut.-Colonel BURGOYNE asked the Secretary of State for War the number of troops at present employed in Mesopotamia; what units of the Air Force are attached to them; what relation the senior Air Force command holds to the senior Army command on the spot, what proposals, if any, are under consideration to increase the number of squadrons in Mesopotamia, and when a decision in the matter will be arrived at?

Mr. CHURCHILL: The strength of the troops on July 1st was as follows:—Mesopotamia: British Army, 9,500; Indian Army, 52,500.

North-West Persia: British Army, 5,000 (including troops in summer camp at Karind); Indian Army, 11,500.

There are two squadrons of the Royal Air Force and an additional squadron is in the process of formation at Basra. The senior Royal Air Force officer is responsible to the General Officer Commanding-in-Chief for carrying out any air operations required. Proposals to increase the number of squadrons of the Royal Air Force in Mesopotamia and reduce the military garrison are being considered, but I cannot say at present when a decision will be reached.

AIR MINISTRY—(CIVIL ENGINEERS).

Mr. CHURCHILL, replying to Mr. PALMER, said that civil engineers employed by the Air Ministry have their hours of service laid down by Order in Council; that Order involves the liability to give service every day, if required between the hours of 10 a.m. and 6 p.m. There are no restrictions as to other occupations outside these hours, and leave is not granted within these hours to such public servants for the purpose of carrying on private business.

* * *

July 27th.—The following oral answer was given:—

MESOPOTAMIA..—CIVIL AND MILITARY EXPENDITURE.

The CHANCELLOR of the EXCHEQUER (Mr. Chamberlain), in reply to Mr. Lambert, said that the Air Force expenditure for the occupation of Mesopotamia is estimated at £482,000.

ROYAL NAVY—SHIP (SALE)

Mr. LONG, in reply to Commander Viscount CURZON, said that the aircraft-carriers *Canning, City of Oxford, Manxman, and Vindex* were on a list of ships for sale.

THE ROYAL AERONAUTICAL SOCIETY.

July 22nd, 1920.

ELECTION OF MEMBERS.—The following have recently been elected to the Scottish Branch in the various grades as shown:—

MEMBERS.—Flying Officer L. W. Allen, M.C., R. T. Currie, G. R. Donald, Capt. T. H. French, D.F.C., R.A.F., Flying Officer F. F. Garroway, R.A.F., Wm. Henderson, C.B., H. A. McCreadie, James Montgomerie, Pilot Officer D. Morton, Col. J. Smith Park, M.V.O., T. E. Pullinger, R. M Reeve, Wing-Cmdr. R. P. Ross, D.S.O., A.F.C., J. B. Taylor, Colonel Wm. G. Thomson, A. de Dorlodot.

ASSOCIATE MEMBERS.—J. H. Alexander, M.B., C.M., Capt. C. R. Alston, Sir G. W. Baxter, Bt., D.L., F. N. J. Bell, B. G. Blampied, Lord Blythswood, M.V.O., H. H. Eiriksson, H. H. Haines, P. C. Kerr, D. Leslie, E. D. McLaren, C. J. R. Morgan, R. L. Robertson, H. Giles Walker, A. J. Younger.

OFFICE.—Members are reminded that the Offiecs at 7, Albemarle Street, W.1., will be closed from July 30th to August 17th during which period the issue of the usual weekly notices will be suspended.

DONATIONS.—The Council desire gratefully to acknowledge the receipt of "The Graphical Treatment of Differential Equations," by the author, S. Brodetsky, Associate Fellow, and "Who's Who in Engineering," which have been placed in the Library.

ANNUAL REPORT.—The Council desire gratefully to acknowledge the gift of the following numbers of the early "Annual Reports" of the Society from an Associate Fellow: No. 1 (1866), No. 3 (1868), No. 4 (1869), and No. 5 (1870). These early Reports are in many cases now exceedingly rare. No. 1 is particularly so, as it contains F. H. Wenham's famous paper on "Aerial Locomotion," reprinted as the first volume of the "Aeronautical Classics," which is also now out of print. The copy of this First Annual Report just received is the only unbound copy of Wenham's paper available for purchase. Any Members who may be in possession of copies of any numbers of the Annual Reports, and wishing to dispose of them, are asked to communicate with the Secretary. Nos. 12 and 18 and 19 (issued together in one volume), are particularly desired.

The Member who recently borrowed the third bound volume of the Reports (1880-1893) from the shelf in the Library is requested to return it, as it is exceedingly valuable, and no other copy is available for reference purposes by other Members.

MACHINE TOOL AND ENGINEERING EXHIBITION.—A letter has been received from the Machine Tool and Engineering Trades Association offering special facilities to Members of the Society during the Machine Tool and Engineering Exhibition to be held at Olympia from September 4th to September 25th. Tickets of admission at half-price may be obtained from the Secretary. Members requiring these should make early application as only a limited number will be available, and it is desired to inform the Machine Tool Trades Association as to the number desired as soon as possible.

LIBRARY.—The London General Omnibus Company have most kindly acceded to a request for copies of confidential reports of their researches on Alcohol Fuel Compounds for Internal Combustion Engines. These are now therefore available for reference purposes by Members, who will no doubt appreciate the courtesy of the Company. It should be understood that these reports are supplied on the express understanding that they will be treated as "Private and Confidential," and will under no circumstances be published.

July 30th, 1920.

ANNUAL REPORTS.—In the above notices it is stated in error that No. 1 of the "Aeronautical Classics" contained a reprint of F. H. Wenham's paper on "Aerial Locomotion." This paper is in fact reprinted in the second volume of the Classics; the first volume, which is out of print, being "Aerial Navigation," by Sir George Cayley, which was first published in Nicholson's Journal during 1809 and 1810, and was reprinted in the Annual Reports of the Aeronautical Society for 1876.

The Secretary is anxious to obtain copies of the Twelfth Annual Report (1878), and the Eighteenth and Nineteenth Reports (1883-1884), which were issued together

AUTUMN SESSION.—The dates of the following lectures have been fixed for the Autumn Session. They will take place at 5.30 p.m. at the Royal Society of Arts, John Street, Adelphi.

October 7th.—(Inaugural Lecture) "Civil Aviation," by Sir F. H. Sykes.

October 21st.—"A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Squadron Leader R. M. Hill.

EDUCATIONAL LECTURES.—In addition to the series of lectures to be given at Sheffield University in October, arrangements are being made, at the request of the Chief Librarian, for one or two lectures in the Fulham Central Library during the coming Autumn.

W. LOCKWOOD MARSH, Secretary.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, July 13th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The following are granted permanent commns. in the Royal Air Force Medical Service (subject to physical fitness and acceptance of final conditions of service when promulgated), with effect from the dates indicated, in the order of seniority shown:—

Wing Cds.—H. V. Wells, C.B.E.; C. E. C. Stanford, D.S.O., M.B., B.Sc.; A. W. Iredell; H. Cooper, D.S.O., B.A.; A. V. J. Richardson, O.B.E., M.B., B.A.; J. McIntyre, M.C., M.A., M.B.; M. W. Flack, C.B.E., Aug. 1st, 1919.

Sqdn. Ldrs.—H. M. S. Turner, M.B.E.; E. C. Clements, O.B.E., W. W. Shorten, F.R.C.S.; W. A. S. Duck, O.B.E.; B. A. Playne, D.S.O., M.B., B.A.; R. H. Knowles, M.D.; H. A. Treadgold, M.D., B.S., B.A.; J. MacGregor, M.C., M.D.; H. A. Hewat, M.B.; H. B. Porteous, M.B.; T. S. Rippon, O.B.E.; F. N. B. Smartt, M.B., B.A.; H. E. Whittingham, M.B.; D. Ranken, M.B., B.S., F.R.C.S., Aug. 1st, 1919.

Flights Lts.—A. S. Glynn, M.B.; A. E. Panter, B.A., H. W. Scott, B.A.; P. M. Keane, Aug. 1st, 1919; T. J. Kelly, M.C., M.B., B.A., March 25th; R. S. Overton; D'Arcy Power, M.C.; J. Rothwell, M.B.; K. Biggs, M.C.; A. J. O. Wigmore, M.B.; J. H. Porter, M.C., M.B.; A. F. Rook; T. C. St. C. Morton, M.B.; G. S. Marshall, O.B.E.; E. W. Craig, M.C., M.B.; R. A. G. Elliott, M.B., B.A.; T. J. Thomas, M.B., B.S.; P. H. Young, M.B.; R. S. Topham, M.B.; T. R. S. Thompson, M.B.; P. C. Livingston; P. J. Flood; J. T. T. Forbes; J. Kyle; C. T. O'Neill, M.B., July 13th.

ROYAL AIR FORCE MEDICAL SERVICE.—The following promotions are made:—

Sqdn. Ldrs. to be Wing Comdrs.—H. M. S. Turner, M.B.E., Dec. 1st, 1919; E. C. Clements, O.B.E., June 1st.

Flight Lts. to be Sqdn. Ldrs.—A. S. Glynn, M.B., Aug. 5th, 1919; A. E. Panter, B.A., Oct. 3rd, 1919; H. W. Scott, B.A., March 8th; P. M. Keane, June 1st.

SHORT SERVICE COMMISSIONS.—The following are granted short service commns. in the R.A.F. Medical Service (subject to physical fitness and acceptance of final conditions of service when promulgated), with effect from the dates indicated, in the order of seniority shown:—

Sqdn. Ldrs. (whilst so empld.).—R. L. Roe, O.B.E., M.B., H. Harvey, F. C. Jobson, Aug. 1st, 1919.

Flight Lts.—E. P. Punch, E. N. H. Gray, R. E. Bell, M.B., C. H. B. Thompson, E. A. Lumley, M.C., M.B., D. G. Boddie, M.B., R. J. Aherne, W. F. Wilson, M.C., M.B., F. J. P. Saunders, W. A. Malone, F. J. Murphy, M.B., H. McW. Daniel, M.B., A. E. Barr-Sim, M.B., P. A. Hall, M.B., B.A., H. B. Troup, R. Mugliston, J. C. Smyth, J. P. Hosford, J. J. O'Mullane, M.B., J. P. Wells, B.A., T. Montgomery, M.B., B.A., A. Briscoe, M.B., E. G. O'Gorman, M.B., T. J. X. Canton, M.B., W. F. Shiel, M.B., A. Watson, M.B., C. H. Young, M.B., July 13th.

Flight Lt. F. J. P. Saunders is secd for duty with the Dir. of Research, April 1st.

The following officers are granted short service commns. in the ranks stated, with effect from the dates indicated. The officers will retain their seny. in the last substantive rank held by them prior to the grant of the short service commn.:—

Flight Lt.—E. P. Hardman, D.F.C. (A.), July 7th.

Flying Officers.—J. B. Allen (A.), July 5th; V. P. Feather (A.), July 10th; J. Talbot (A.), July 3rd.

Observer Officers.—W. W. Bradford, June 28th (substituted for notification in "Gazette" of July 2nd). The name of Observer Officer J. R. Stafford-Langan, D.F.C., is as now described, and not as shown in "Gazette" of Sept. 12th, 1919. Flying Officer S. G. Frogley, D.S.O., D.F.C. (A.), resigns his short service commn. and is granted rank of Flight Lt., June 24th.

SHORT SERVICE COMMISSIONS.—Flying Officer R. B. Sutherland, D.F.C. (Canadian Engrs.), is granted a short service commn., July 2nd.

FLYING BRANCH.—Sqdn. Ldr. K. R. van der Spuy, M.C., relinquishes actg. rank of Wing Comdr. on ceasing to be empd. as Wing Comdr., May 21st.

ADMINISTRATIVE BRANCH.—Flight Lt. O. V. Thomas, O.B.E., to be Flight Lt., from (T.), Sept. 20th, 1919, and is graded for purposes of pay and allowances as Sqdn. Ldr. whilst empld as Sqdn. Ldr., Sept. 20th, 1919.

MEMORANDUM.—Flight Lt. A. P. M. Sanders is restored to the Active List, July 15th.

AIR MINISTRY, July 16th.

R.A.F.—PERMANENT COMMISSIONS.—The notification in "Gazette," Nov. 7th, 1919, appointing Flying Officer E. D. G. Galley, M.C., A.F.C. (A.), to a permanent commn., is cancelled.

SHORT SERVICE COMMISSIONS.—The notification in "Gazette" of July 13th concerning Flying Officer R. B. Sutherland, D.F.C. (Can. Engrs.), is cancelled.

AIR MINISTRY, July 20th.

R.A.F.—PERMANENT COMMISSIONS.—Flying Officer A. H. G. Dunkerley (A.) resigns his permanent commn., and is granted the rank of Flight Lt., May 27th (substituted for notification in "Gazette" of June 22nd).

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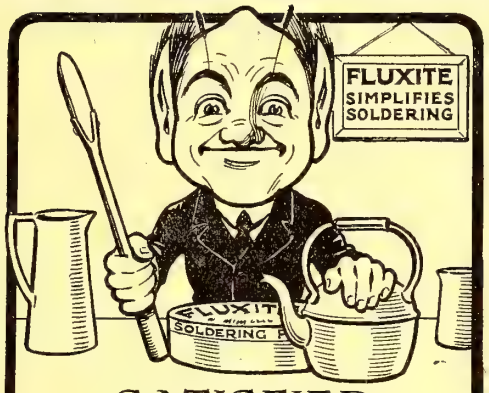

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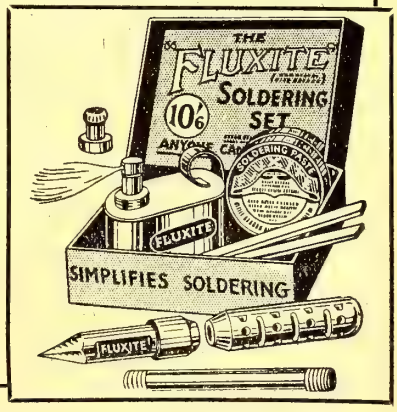

Administrative Branch.—Pilot Officer J. H. E. Weekes to be Flying Officer, May 11th.

Lt. S. Wyatt is placed on the Retired List, July 21st.

Technical Branch.—Flying Officer F. N. Trinder is graded for purposes of pay and allowances as Flight Lt. whilst empld. as Flight Lt., Grade (A), May 15th, 1919.

Pilot Officers to be Flying Officers.—B. T. Crook, R. B. Harnden, Oct. 1st, 1919.

Air Ministry, July 23rd.

ROYAL AIR FORCE.—Permanent Commissions.—The notification in "Gazette" of Aug. 1st, 1919, apptg. Lt. F. Everett (T.) to a permanent commn. is cancelled.

Short Service Commissions.—The following officers are granted short service commns. in ranks stated, with effect from dates indicated, retaining their seny. in substantive rank last held by them prior to grant of this commn., except where otherwise stated:—

Flight Lts.—W. F. Anderson, D.S.O., D.F.C. (A.), July 21st; J. O. Groves (A.), July 14th; G. R. Hill (Ad.), April 1st (for duration of present appt.).

Flying Officer (from Flight Lt.).—N. H. Dimmock, A.F.C. (A.), July 19th.

Flying Officers.—J. H. Hargroves (A.), M. Hyslop (A.), July 21st; C. W. Bragg (A.), A. M. G. Cosgrave (A.), C. G. Ferrell (A.), July 19th; F. J. Fogarty (A.), L. Hamilton, D.F.C. (A.), S. L. H. Potter (A.), July 14th.

Observer Officer.—J. F. Titmas, July 14th.

Flying Officers (from Pilot Officers), with seny. of the dates indicated.—E. H. Alliott (A.), July 16th; A. A. B. Chipper (A.), July 20th; M. C. Dudding (A. and S.), July 15th; J. C. Dunbar (A.), July 22nd; M. S. Hale (A.), July 19th.

Flying Officer Dimmock will be placed at the head of the list of Flying and Observer Officers, and will retain seny. relative to officers who have been similarly gazetted to short service commns. in a rank lower than their previous substantive rank in accordance with his previous position on the gradation list.

The notification in the "Gazette" of Sept. 12th, 1919, apptg. Flying Officer E. Parrett (T.) to a short service commn. is cancelled.

The notification in the "Gazette" of May 18th apptg. Flying Officer H. C. Hawkins (A.) to a short service commn. is cancelled.

Flying Branch.—Flight Lt. R. R. Mansell, O.B.E., is placed on the half-pay list (Scale B), July 24th.

War Office, July 23rd.

Regular Forces.—Infantry.—The following resign their commns. on appt. to permanent commns. in the R.A.F. (Aug. 1st, 1919):—R. Fus.—Lt. R. M. Foster, D.F.C. Linc. R.—Lt. D. Colyer, D.F.C. Devon. R.—Lt. L. G. Wood. Som. L.I.—Lt. E. R. Pretyman, A.F.C. Lan. Fus.—Maj. and Bt. Lt.-Col. L. E. O. Charlton, C.B., C.M.G., D.S.O.; Lt. C. B. Godfrey. R. Sc. Fus.—Capt. R. J. F. Barton, O.B.E.; Capt. A. C. Bolton, M.C. Sco. Rif.—Capt. L. Wanless-O'Gowan. E. Surr. R.—Lt. H. G. P. Ovenden. D. of Corn. L.I.—Lt. R. C. Jenkins, M.C. S. Lan. R.—Lt. J. Kemper, M.B.E. Oxf. and Bucks L.I.—Maj. and Bt. Col. H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C. R. Berks R.—Lt. F. J. Smith, M.C., M.M. Manch. R.—Lt. C. R. Cox, A.F.C. N. Staff. R.—Lt. C. R. Keary. York and Lanc. R.—Maj. and Bt. Lt.-Col. A. B. Burdett, D.S.O. Arg. and Suthd. Highrs.—Lt. A. McR. Moffatt. Leins. R.—Capt. V. S. E. Lindop. R. Dub. Fus.—Lt. E. B. Rice. Rif. Brig.—Lt. N. W. Wadham.

Air Ministry, July 27th.

ROYAL AIR FORCE.—Adminibrative Branch.—Pilot Officer to be Flying Officer.—A. C. Cunnison, Nov. 1st, 1919.

Technical Branch.—Flight Lt. G. L. Hunting to be Flight Lt., Grade (A.), from (S.O.), Feb. 17th.

Pilot Officer to be Flying Officer, Grade (B.):—H. J. Brown, Oct. 1st, 1919.

Memorandum.—Wing Commr. J. W. O. Dalgleish, O.B.E., is restored to the active list, July 26th.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of The Aeroplane. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

Marriages.

ALLEN—JOHNSON.—On July 28th, at Winchester Cathedral, by the Rev. Canon Vaughan, assisted by the Rev. Capt. Keymer, O.B.E., C.F., R.A.F., William Shepherd Allen, R.A.F., only son of W. Allen, Esq., J.P., of Woodhead Hall, Cheadle, Staffs., to Clara Eleanor, only child of the late Henry Godwin Johnson and of Mrs. Johnson, Longclose, St. Cross, Winchester.

JENNER-PARSON—MACKWORTH-PRAED.—At St. Peter's, Owsden, Suffolk, the marriage took place quietly on July 22nd, from Owsden Hall, the residence of Mr. and Mrs. A. M. Praed, of Flight Lieut. C. H. B. Jenner-Parson, R.A.F., younger son of the late Charles Jenner-Parson, M.D., of Godalming, Surrey, and Mrs. Fleming, of 2, St. Helen's Towers, Southsea, Hants, to Miss Violet Mackworth-Praed, only daughter of the late Robert Herbert Mackworth-Praed, of Mickleham Downs, Surrey, and of Mrs. Mackworth-Praed, of Dalton Hill, Albury, Surrey.

LAURENCE—STOPFORD.—The marriage took place on July 27th, at St. Paul's, Knightsbridge, of Captain C. Laurence, D.S.C., late R.A.F., youngest son of Mr. and Mrs. F. Laurence, of Half Yoke, Maidstone, and Lady Sybil Stopford, eldest daughter of the Earl of Courtown. The Bishop of Ossory officiated, assisted by the Rev. Arthur Bernard Littlewood, Vicar of East Farleigh, Maidstone.

SEYMOUR—OSBORN.—On July 17th, at St. Margaret's Church, Cape Town, Ernest Albert Seymour, of Bloemfontein (late R.A.F.), was married to Doris Isabel Osborn, only daughter of Mr. and Mrs. T. C. Osborn, of 28, Pembridge Square, W.2.

Deaths.

EDWARDS.—Janey Sarah Edwards, who was accidentally killed at Lakenheath Station on July 20th, was the daughter of the late Robert Edwards, Budleigh Salterton, and wife of Capt. H. B. Smith, R.A.F., M.C., The Hiss, Brandon.

MOIR.—Mr. Hamish Moir, late Lieut., R.A.F., only son of Mrs. Moir and the late J. A. Moir of Ceylon, was recently drowned at Newara Eliya, Ceylon, as the result of a motor accident.

Births.

MORGAN.—July 20th, at Manley Road Nursing Home, Waterloo, Liverpool, the wife of Flying Officer W. Morgan, R.A.F.—a daughter.

MURRAY.—On the 29th July, to Phyllis, wife of Capt. D. G. Murray, at 5 Redcliffe-gardens, S.W.10—a daughter.

EMPLOYMENT.

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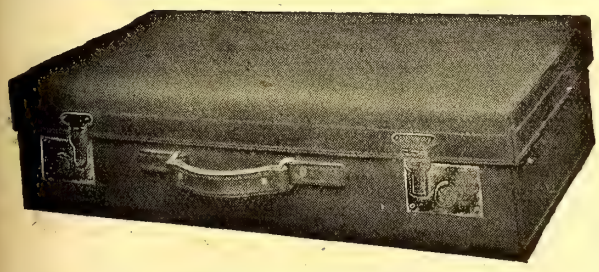

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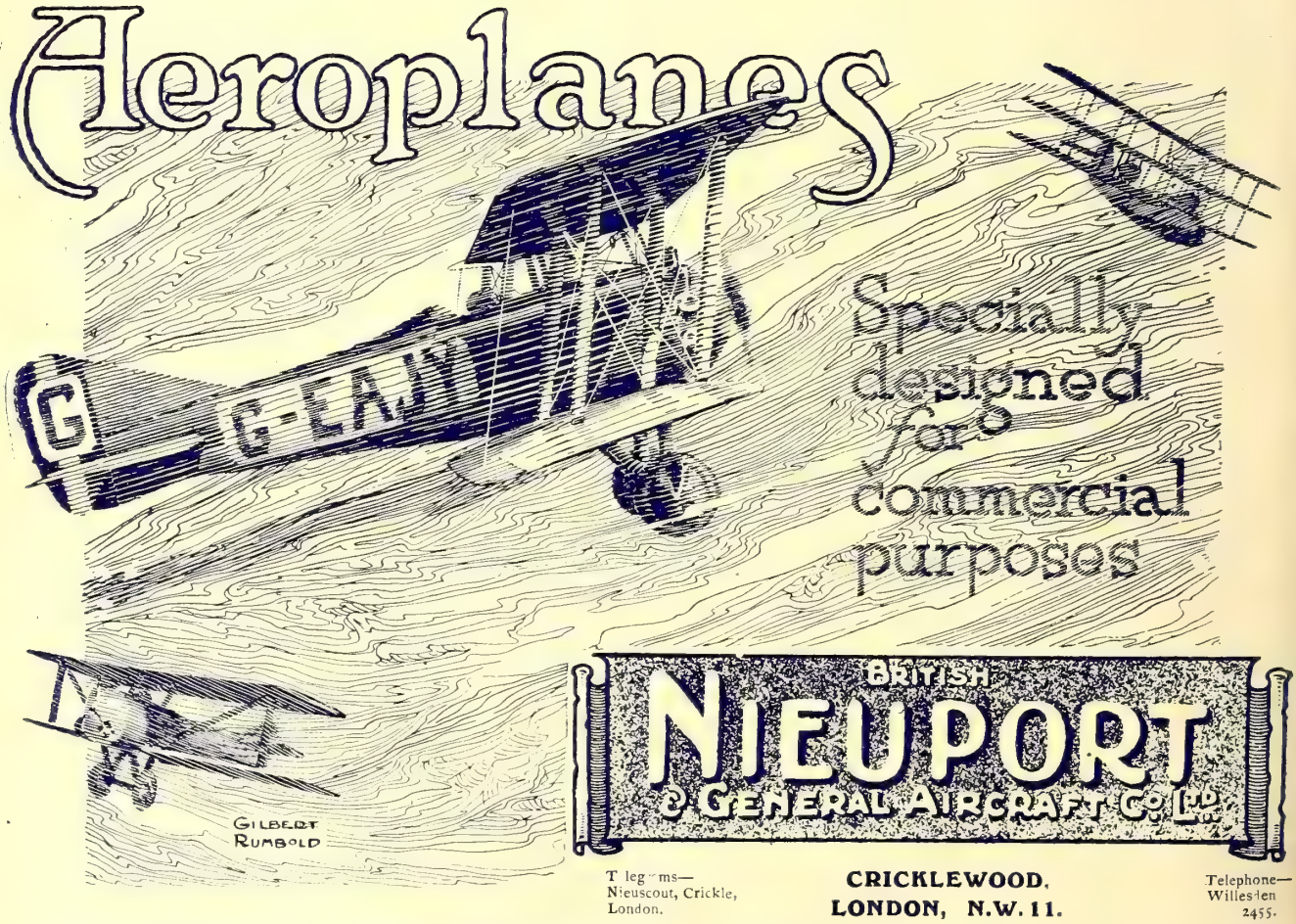

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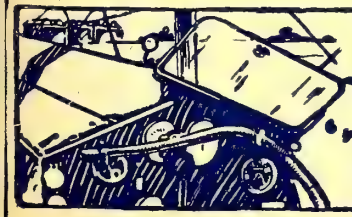

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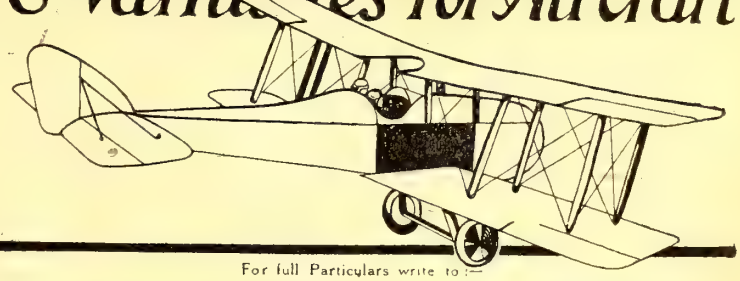

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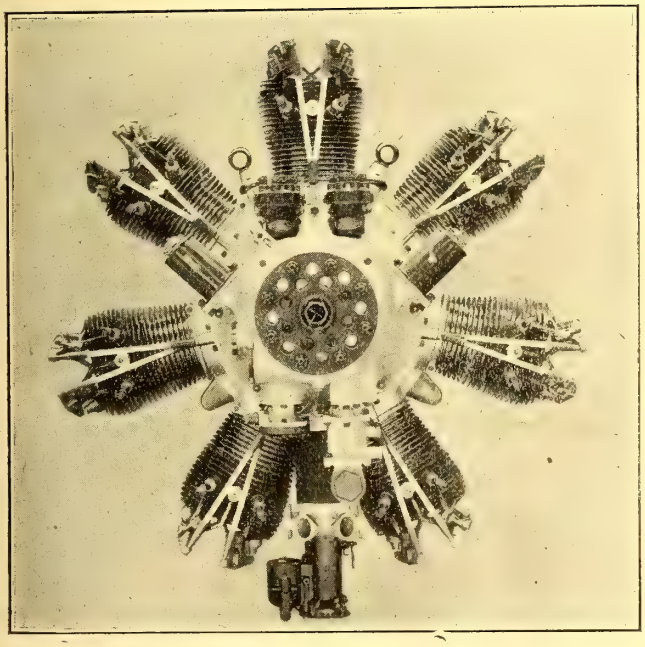

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ON AIRWORTHINESS.

It seems well just at this moment, while the Government "Comfort and Security" Competition is in progress, to remind owners, operators, and users of aircraft that before very long the matter of airworthiness in aircraft will assume an aspect very different from that of to-day. When the "Air Navigation Bill" which is now before Parliament becomes law the Air Ministry will have considerably more authority than it has at present. And so, whether the present comic competition at Martlesham Heath turns out ultimately to be any real benefit or not (personally one inclines towards not), the new Bill when it becomes an Act will make for considerably greater security of body, and thus to greater comfort of mind, than exists at present.

The Benefits of Accidents.

When the Marquess of Londonderry, our very excellent Under-Secretary of State for Air, introduced the new Bill in the House of Lords on May 11th, he put the case with his usual brevity and lucidity. He said: "The first essential is to have some proper authority to find out exactly the cause of each accident, so far as it is discoverable, with a view to obtaining the same degree of safety as is possessed by railway administration to-day. A second reason is that comparative safety is essential to the development of civil aviation as a recognised method of public transport of passengers.

"There have been 28 civil accidents between May 1st, 1919, and March 31st last, and the experience gained in investigating them has been of great value. It is, however, essential, from the fact that aircraft usually crash in private property, to have right of access to such property, to investigate the *débris*, and to prevent the machine being removed pending the inquiry. It is considered necessary to take power to hold a formal investigation of the same kind as is conferred on the Board of Trade under the Regulation of Railways Act, 1871."

A Powerless Power in the Land.

Many people are under the impression that the Air Ministry has absolute power over the doings of all aviators and over all who own or operate aircraft. As a matter of fact the Air Ministry has very little power of any sort until the new Bill becomes law. The Air Ministry certainly has the power to grant licences to aviators and to grant airworthiness certificates to aeroplanes, but, so far as one can discover, the Air Ministry as such has no power to prosecute an unlicensed pilot for flying an uncertificated machine. Nor has it actual power to investigate accidents—as Lord Londonderry's speech shows.

It is true that the local police can prosecute if they think fit. For example, they prosecuted a pilot at Fenny (or Stoney) Stratford who was taking up passengers "for fee or reward" without a licence while on his way to Coventry. But the Air Ministry itself could not, one believes, have instituted the prosecution.

Furthermore, it appears that when once a pilot has been licensed his licence cannot be withdrawn or cancelled or endorsed. The worst that can happen to him when once he has got his licence is that he may be turned down by the medical people when he comes up for his six-monthly inspection.

Also, when once a machine has been passed as airworthy its certificate cannot be withdrawn, and it can be used in a thoroughly unfit state so long as a "licensed ground engineer," who is as often as not an employee of the owner or operator of the machine, can be induced to sign for its airworthiness day by day.

If anybody is killed, or seriously damaged, by the carelessness or incompetence of the pilot, or through the unfitness of the machine, then the Common or Criminal Law of the Land applies. But the Air Ministry itself cannot prevent accidents by forbidding the pilot to fly or forbidding the use of the machine when once certificates or licences have been issued.

The New Power in the Air.

Therefore is it eminently satisfactory to find the following section in the new Bill:—

12.—(1) The Secretary of State may make regulations providing for the investigation of any accident arising out of or in the course of air navigation and occurring in or over the British Islands or the territorial waters adjacent thereto, or to British aircraft elsewhere.

(2) Without prejudice to the generality of the foregoing provision regulations under this section may contain provisions—

(a) Requiring notice to be given of any such accident as aforesaid in such manner and by such persons as may be specified in the order;

(b) Applying, with or without modification, for the purpose of investigations held with respect to any such accidents any of the provisions of section three of the Notice of Accidents Act, 1894; (57 & 58 Vict. c. 28).

(c) Prohibiting, pending investigation, access to or interference with aircraft to which an accident has occurred, and authorising any person, so far as may be necessary for the purpose of investigation, to have access to, examine, remove, take measures for the preservation of, or otherwise deal with any such aircraft;

(d) Authorising or requiring the cancellation, suspension, endorsement, or surrender of any licence or certificate granted under this Act, or any order made thereunder where it appears on an investigation that the licence ought to be cancelled, suspended, endorsed, or surrendered, and for the production of any such licence for the purpose of being so dealt with . . .

(3) If any person contravenes or fails to comply with any regulations under this section, he shall be liable on summary conviction to a fine not exceeding fifty pounds or to imprisonment with or without hard labour for a term not exceeding three months.

What is an Owner?

It is also to be noted that in the Bill the word "owner" includes "any person to whom the aircraft is demised" or "any person to whom the aircraft is hired at the time of the offence." That is to say, either the pilot or the hirer may be held responsible for an accident or trespass if the machine is out of the hands of the real owner at the time.

And, finally, the new Bill gives the Air Ministry the actual power necessary to institute proceedings against those who break the Law of the Air.

All of which is very much to the good, and will not only make flying much safer in the future, but will enhance still further the reputation of British aircraft abroad.

The Need for Stringency.

There is no doubt that the whole system of checking the airworthiness of aeroplanes needs tightening all round. This is certainly not due to any lack of keenness or energy on the part of General Bagnall-Wild or his Aeronautical Inspection Department, but simply because under the old Act that Department has not the power to make its work as effective as is desirable.

It can refuse an airworthiness certificate when application is made for a new certificate, but it cannot withdraw that certificate when once granted. Also, one believes that it has not as yet the power to insist on such detailed inspection as may seem desirable in some cases of machines which have been in use for a considerable time.

Some time ago a fatal accident occurred in a machine which was called an Avro in the accounts of the accident. This machine had been built during the war by another firm, and not by the Avro Company. It had been used as a school machine for a considerable time and had then been sold to another owner for passenger-carrying of the kind commonly called "joy-riding." Finally it collapsed in the air with fatal results.

Now, though the Air Ministry's Accidents Committee has investigated the case, no report as to the cause of the accident has been published. The result is that a considerable number of people must be under the impression that the affair was merely one of the incidents inseparable from flying. One ventures to suggest that quite a different impression might be given if all the facts were known.

Desirable Publicity.

For example, it should be made clear that the machine was not by any means new. Also the date of inspection for its airworthiness certificate by the A.I.D. should be published. And the public should be told whether that inspection included the opening up of the wings and fuselage so that the state of the internal structure could be investigated. Furthermore, the position and technical qualifications of the individuals who vouched for its airworthiness day by day should be stated.

So much publicity at least is desirable from all points of view. The owner or owners of the machine would, one feels sure, be glad of a public statement to make it clear that they were not to blame. The Avro Co. would certainly wish to have it known that they were not in any way concerned. The makers of the machine, whether now in the Aircraft Industry or not, would be equally glad of full publicity. The A.I.D. would also, one feels sure, like to have it known that they did all that lay in their power to assure its airworthiness.

The Allocation of Blame.

On the other hand, if blame can be fixed on any firm or individual, that blame should be allocated publicly without fear or favour, just as blame is allocated to any unfortunate engine-driver or signalman who makes a mistake and causes a railway accident. There is even more reason why blame should be fixed on individuals responsible for aeroplane accidents than on those concerned with railway work, for the flying and operating of aeroplanes is not only more individual work, but at the moment bad work or carelessness has much more far-reaching results in aviation than in the running of railways. Yet, so far as one can discover, the Air Ministry has not even the power to issue such a report as one has suggested. Whether it is that there is no Department which could issue such a report; or whether it is that the Accidents Committee is only concerned with the technical details of breakages and is not entitled to take evidence as to A.I.D. inspection, the competence of owners or operators of aircraft, and the previous history of machines: or what is the hindrance, one does not profess to know.

Harmful Concealment..

The fact remains that though, as Lord Londonderry said, "the experience gained in investigating them (accidents) has been of great value," that value has not been anything like as great as it might have been, for the very good and sufficient reason that the results of the investigations have been confined to the technical people within the Air Ministry.

Neither the aircraft constructors, nor the readers of the technical papers, nor the general public, who, it is hoped, will become regular users of aeroplanes some day, are allowed to know these results. And so false ideas, damaging rumours, and erroneous statements are allowed to circulate, to the very great detriment of Civil Aviation.

The Value of Reputations.

Of course, the great aircraft manufacturing firms themselves do not need the close and constant inspection which is necessary, or at any rate advisable, in the case of individuals or small firms who are merely operating machines built by other people. To the big firms their business reputation is so vital that their own internal inspection is far more rigid than anything on which the A.I.D. could insist.

When, for example, Mr. Handley Page flies to Paris, as he did last week for the first time (incidentally, in his humorous way, announcing himself thereafter as a confirmed convert to faith in commercial aviation), one may be fairly sure that all his firm's machines are very thoroughly inspected before every flight. When Mr. A. V. Roe flies, as he does frequently from his home near Hamble to London, and from London to his works at Manchester, one may bet on the airworthiness of his products. When Mr. Sopwith again takes to the air, as he did last week, there can be no doubt about the machines in which he flies.

Suspection and Inspection.

But when a little syndicate of local commercial men or former Service aviators get hold of an obsolete war machine or two, and fake them up for passenger carrying, in the hopes of making money out of them during the summer and autumn holiday seasons with the smallest possible expenditure of capital and labour, then it is evident that very close and frequent official inspection is necessary.

Also, when, as will happen in due course, air lines become money-making concerns, with the help of congested roads and high railway fares, some air lines will be run as some shipping concerns are run, on the good old principle of making money out of freights as long as it can be done and drawing the insurance money on a total loss when the craft is past earning any more. Then the most rigid inspection will be necessary.

Lighter-than-Air-Craftsmanship.

Ultimately, also, airships will acquire some commercial value. When it is no longer a joke, but merely a matter of consulting a time-table, to discover the answer to the question, "Where do the airships go to in the winter time?" lighter-than-air-craft will in their turn need airworthiness certificates, and most elaborate inspection will be necessary.

Which will doubtless rejoice the heart of General Bagnall-Wild and his confederates. And one hopes that not only the power but the personnel will be permitted to the A.I.D. to assure such inspection being fully effective.

Enabling Bill.

As may have been gathered, the new Bill concerns exclusively the Department of Civil Aviation. Sir Frederick Sykes, Controller-General of that Department, has laboured strenuously for the good of Civil Aviation ever since hostilities ended, and under the most difficult circumstances. He has had, so to speak, position without power, an office without officials. He has had to work with words rather than deeds. And yet he has done much to establish this undeserving country as the leader of the world in Civil Aviation.

Sir Hugh Trenchard has made the R.A.F. the leading militant power in the air. One hopes that the new powers conferred on the Air Ministry by this enabling Bill will enable Sir Frederick to place British Civil Aviation in as dominant a position as that occupied by the R.A.F. Then we shall indeed be able to claim the Command of the Air.—C. G. G.

THE AIR MINISTRY COMPETITION.

In accordance with the programme the Air Ministry "Comfort, Safety, and Economy" Competition for large and small aeroplanes duly opened on Tuesday, Aug. 3rd, at Martlesham Heath. The list of entrants for these two sections was as follows :—

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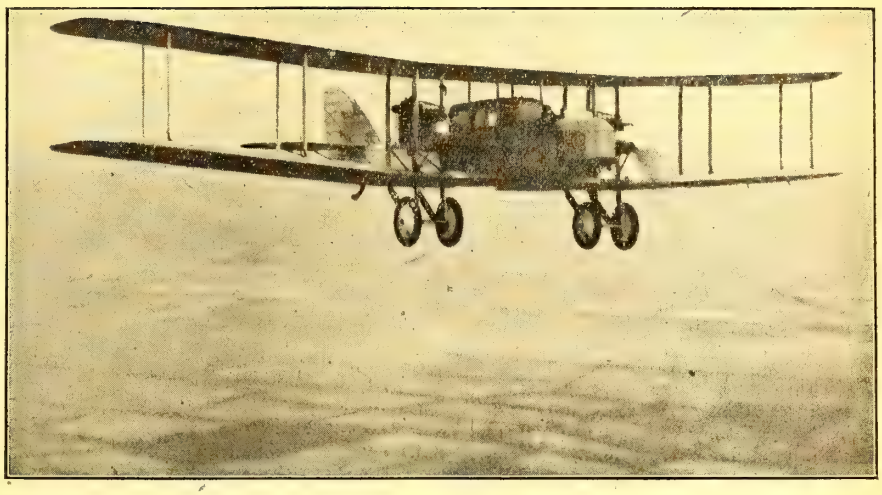
3. Bristol Aeroplane Co., Ltd.
4. Petters, Ltd. (The Westland Aircraft Works).
5. A. V. Roe and Co., Ltd.
6. Sopwith Aviation and Engineering Co., Ltd.

Of these the Aircraft Manufacturing Co.'s entry has been withdrawn in fact, though it is understood that no official intimation to that effect has arrived.



The Central Aircraft Company's two-engined biplane entered for the large aeroplane section of the Government Competition.

Of the remaining three large machines, two, the Vickers "Vimy Commercial" and the Handley Page W.8, had arrived on the specified date (Tuesday, 3rd). The Central Aircraft Company's Centaur 2A was delayed *en route* by a broken petrol pipe and reached Martlesham on Wednesday.

All the small machines had arrived, whole or in part, on the Tuesday, with the exception of the Sopwith entry, which, however, arrived on Wednesday morning with Mr. Sopwith on board, piloted by Captain Jordan.

The small machines are the following :—

AUSTIN MOTOR CO.—Austin "Kestrel," a two-seater "side by side" version of the well-known "Whippet." The construction is in general very similar to the better-known single-seater, but a 200-h.p. Beardmore engine is fitted. Conventional type wire bracing is fitted to the wings.

WILLIAM BEARDMORE, LTD.—The Beardmore W.B.X, a Beardmore-engined two-seater, carrying the passenger in front in a totally enclosed cabin. It is notable for the fact that duralumin enters very largely into its construction.

THE BRISTOL AEROPLANE CO., LTD.—The Bristol "Seely"—a modification of the well-known Bristol Tourer.

WESTLAND AIRCRAFT WORKS.—A Napier-engined machine very similar in general arrangement to the Limousine, fitted to carry five passengers and pilot.

A. V. ROE AND CO., LTD.—The Avro triplane with the Siddeley "Puma" which appeared at Olympia.

THE SOPWITH AVIATION AND ENGINEERING CO., LTD.—The Sopwith "Antelope" which was shown at the Aero Show.

On Tuesday the proceedings were confined to the examination and weighing of such machines as had arrived.

On Wednesday morning work commenced at 5 a.m., the Avro triplane making the flights for the high-speed test and reaching a speed of 95.7 m.p.h.

At 12.47 the Sopwith "Antelope" started on the endurance and economy test—two flights of $3\frac{1}{2}$ hours each at not less than 80 m.p.h., with an interval of not more than one hour between. The first $3\frac{1}{2}$ hours was completed at 4.15 p.m., and after tea the machine ascended at 5.10 and completed the test.

During the day the Westland, the Handley Page, and the Vickers all made trial flights. The Handley Page is reported to have damaged one airscrew, and it is possible that this may delay her tests.

On Thursday and Friday inclement weather prevented any continuation of the trials.

On Saturday the Avro triplane started early on its reliability and economy tests, and was followed shortly by the Vickers "Vimy." Both machines completed their trials, the "Vimy" paying a visit to Margate in the course thereof.

On the same day the Sopwith Antelope, the Austin "Kestrel" and the Bristol "Seely" all ran over the speed course for their speed trials.

TABLE OF RESULTS UP TO AUGUST 9TH.

Machine.	Pilot.	Weighed empty.	High and Low Speeds.	Reliability and Economy.	Self-controlled flight	Landing (glide).
Central Aircraft Co.	F. B. G. Castleman.	—	—	—	—	—
Handley Page, Ltd.	Major Brackley	—	—	—	—	—
Vickers, Ltd.	Capt. Cockerell Capt. Broom	4/8/20	—	Accepted 7/8/20 ($\frac{W}{G}$=6.33)	—	—
Austin Motor Co., Ltd....	M. D. Nares	4/8/20	High Speed, 6/8/20, 109.96 m.p.h. Slow Speed, 8/8/20, 45.1 m.p.h.	—	5/8/20	5/8/20
W. Beardmore and Co., Ltd.	G. Powell	7/8/20	—	—	—	—
Bristol Aeroplane Co., Ltd.	C. F. Uwins	3/8/20	High Speed, 7/8/20, 108.3 m.p.h.			
Westland Aircraft Works	A. S. Keep	6/8/20	—	—	—	—
A. V. Roe, Ltd.	Capt. Hamersley	3/8/20	High Speed, 4/8/20, 95.7 m.p.h.	Accepted 7/8/20 ($\frac{W}{G}$=3.63)	—	4/8/20
Sopwith Aviation Co., Ltd.	H. G. Hawker	3/8/20	High Speed, 6/8/20, 110.35 m.p.h.	Accepted 4/8/20 ($\frac{W}{G}$=4.3	6/8/20	5/8/20

SIX MONTHS OF CIVIL AVIATION.

(Concluded from the issue of July 28th.)

AMERICA.

CUBA.

The Cuban Government is said to intend to spend 15,000,000 dollars (about £3,950,000) on the purchase of aircraft. The Farman firm with pilots already in Cuba are organising a Cuba-U.S.A. air service.

ARGENTINA.

An Aviation Division in the Ministry of Marine was formed in October, 1919, and 250,000 pesos are set aside in the Budget for 1920 for the purchase of war material.

Three companies, (1) the Compania Franco-Argentina des Transportes Aereos (of French origin), (2) the Compania Argentina des Transportes Aereos, associated closely with Saenz Mai and Co. (both these two companies owe their existence to the acquisition of French and Italian surplus stock left by military missions), and (3) the Sociedad Rio Platense de Aviacion, are in existence.

A second mission from Italy arrived at Buenos Ayres on March 29th. It is composed of pilots and mechanics sent by the Ansaldo Company.

The Curtiss Aeroplane and Motor Corporation has representatives in the country and is said to be training officers and civilians at Palomar. It is believed that the Ministry of Marine has bought a few Curtiss machines.

BRAZIL.

As a result of the mission established in October, 1918, France have valuable aeronautical contracts, and is to train and equip the Brazilian Flying Corps.

There is an Italian propagandist mission in Brazil.

Nine Curtiss aeroplanes, it is understood, have been ordered from the United States of America.

The British Government has made a gift of aeroplanes to Brazil.

A prize of £10,000 is on offer for the first flight from Lisbon to Rio de Janeiro. It is understood that the Ministry of Marine has £10,000 to spend in giving assistance.

CHILI.

A late R.A.F. officer was given charge in November, 1918, of instruction at the military aviation camp. The contract expires in November this year.

British firms are endeavouring to obtain commercial aviation concessions.

COLOMBIA.

On April 11th, 1919, the Ministry of the Interior called for public tenders for aerial transport.

The French have contracted with the Compania Columbiania de Navegacion Aerea (capital £160,000) to send out pilots and mechanics to lay out aerodromes and establish services between various towns.

Report says that a company with French capital has been formed to establish seaplane service on the River Magdalena.

ECUADOR.

There is an Italian mission in Ecuador.

The Americans are reported to have offered a supply of aircraft to the Army. The Government asked in December, 1919, for particulars of British aircraft for military use.

PERU.

The country is mountainous and seaplanes are the most useful form of aircraft for Peruvian use.

The Peruvian Post Office have asked for air route tenders (between Tarma and Iquitos) from several European and American firms.

Several British firms have made proposals to the Government.

The Curtiss Company has three machines in the country and is trying to secure the aerial services contract.

THE UNITED STATES OF AMERICA.

Senator New's Bill for the creation of the Air Department has, in view of the high costs involved, been referred back to the House Committee on Military Affairs for amendment.

Several States and cities have formulated independent measures for air regulations. The probable result will be similar lack of co-ordination in aerial law as in the existing U.S. motor law. The "Air Service has formulated rules of the air as a guide to pilots."

A Bill to regulate the use of aircraft introduced in the New York State Assembly on February 26th, was referred to the Committee of the Judiciary.

The Government run air mail services from New York to Washington and Chicago.

Many air transport companies have been formed. A daily mail service between Manilla, Fort Mills and Santa Cruz in the Philippines has been opened.

So ends my précis of the official "Half-yearly report on the Progress of Civil Aviation (Oct. 1st, 1919—March 31st, 1920), issued early in July by the Air Ministry.—W. E. DE B. W.

A CLAIM BY M. ROBERT ESNAULT-PELTERIE.

In 1907 M. Robert Esnault-Pelterie, even in those early days distinguished in aeronautical investigation, patented the single lever for operating both longitudinal and lateral controls. Some time before the outbreak of the war in 1914 he instituted proceedings against various firms of aeroplane constructors, which, however, were interrupted by the outbreak of hostilities.

In 1918 M. Esnault-Pelterie reopened his action against alleged infringers of the patent in question, claiming a sum of 2,000 francs in respect of each machine fitted with the device. The Court has ordered the question as to the amount of damages to be considered by a committee of experts, and in the meantime an injunction has been granted to the inventor prohibiting payment to the alleged infringing firms of the sums due to them from the French Government for aircraft built by them.

Four firms have applied for the removal of this injunction, and in three cases the decision has been adjourned. In the fourth case—that of Vickers, Ltd.—the Court has reduced from £60,000 to £32,000 the amount to be withheld against this claim.

It is estimated that the total sum involved is something over 50 millions of francs.

AERIAL TRAFFIC AND "JAMMED" WIRELESS.

Now that several machines on the Continental air lines are fitted with wireless telephones, forced landings and accidents should be reduced to a minimum. Steps should be taken, however, by the Air Ministry against Chelmsford Wireless Station, or any similar offender, if the occurrences of Friday last are repeated.

On that day at about 15.00 hrs. Mr. Barnard on the Vickers "Vimy" belonging to the Instone Air Line was crossing the Channel in a thick fog and was trying to obtain weather reports from Lympne. All he could hear was a concert which was being given by the Chelmsford Wireless Station to the world at large, causing jamming, which, while doubtless very charming to those in charge of the much-boomed Carmelite House or any other listening-in set, was not so attractive to the pilot of the "Vimy" in the fog as would have been weather reports from Lympne.

One of these days there will be a serious crash or a machine will be lost at sea, through a pilot coming over in bad weather trusting in his wireless, only to find it is being used as a toy to amuse children.—G. D.

A PIONEER RETURNS.

Commander P. Harrington Edwards, D.S.O., senior partner in Harrington, Edwards, and Cobban, solicitors, of 33, Southampton Street, Strand, W.C.2, has now been demobilised and has returned to the active practice of his profession.

Commander Edwards will be remembered by the pioneers of aviation as a very active propagandist in the early days. He organised in 1911 a thoroughly excellent scheme of landing grounds to cover the main air routes in the British Isles, and registered a company which was to control these landing grounds under the clever title of A.I.R., Limited, the initials standing for "Aeronautical Investigation and Research." Unfortunately public interest in aviation at that period was not sufficient to give the company control over the suggested landing grounds, though Commander Edwards's foresight is confirmed by the fact that to-day aerodromes exist at practically all the places indicated in his original scheme.

One hopes that now that Commander Edwards has returned to civilian life he will renew his interest in civil aviation as well as in the legal profession.

THE AERIAL DERBY WELSHERS.

One is glad to be able to state that at least one group of the absconding "bookies" from Hendon has been caught and prosecuted. Three men who performed under the "nom de politesse" of "Jack Jones," whose most real names are Yates, Brynston, and Levy, were brought up at Hendon in the week following the Aerial Derby and were remanded on bail for a fortnight. During this interval they whiled away the time in trying to make a little more pocket-money at Goodwood by attempting the same tactics.

Being somewhat "fat and scant of breath" they were again, unfortunately (for them), apprehended, and are now spending a pleasant holiday, untrammelled by thoughts of increased railway fares and excess profits duty, at the expense of a grateful country. One hopes that during their period of enforced activity they will find time to peruse The Aeroplane, so that at next year's event they will offer more reasonable odds and so not disappoint their patrons, of whom one will not be one.—G. D.

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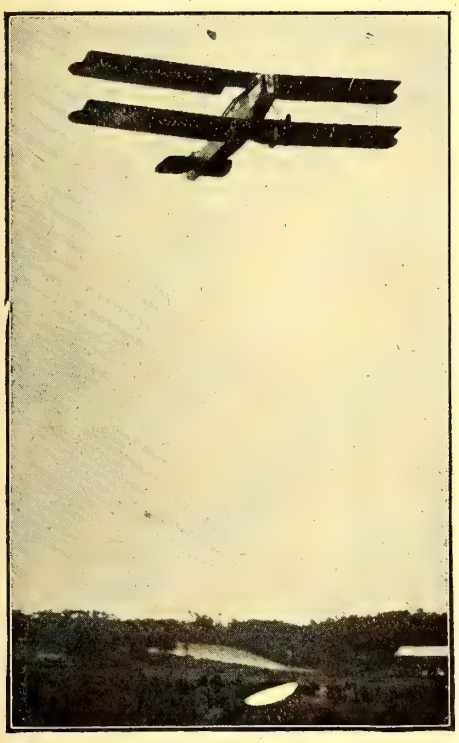

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NAVAL AND MILITARY AERONAUTICS.

GREAT BRITAIN.

NAVAL

ADMIRALTY APPOINTMENTS.

The following appointment has been made :—

Aug. 7th.—Lieut.-Comdr.—E. B. Arathoon, to *Furious*, Aug. 6th.

AUG. 9th.—Gunner (T.).—J. W. Heather, to *Aagus*, Aug. 7th.

AIR FORCE.

CADETSHIPS IN THE ROYAL AIR FORCE.

The following statement was issued on Aug. 5th :—

The following are declared by the Civil Service Commissioners to be the successful candidates at the competitive examination held in June, 1920, for Cadetships at the Royal Air Force Cadet College; but their admission is conditional to their having passed the medical examination.

A table of marks will be sent to each candidate as soon as possible :—

*Barnes, L. K.	11608	Keey, E. C.	7733
*Sealy, C. F.	10600	Fleming, T. S. S.	7223
Swales, N. R.	9850	Coghill, J. A. C.	7119
Vintcent, N	9471	*Stevens, C. H. A.	7063
*Anson, C. O.	9436	*Pakes, C. W. S.	7029
Curry, W J	9399	Reid, E.	6936
Macfadyen, D.	9388	Riccard, C. S.	6930
Carey, B.	9151	Schmidt, C. C.	6911
Bruce-Bennett, V.	9081	Hiddingh, A. G.	6676
*Healy, E. A.	8716	*Dawson, W. L.	6669
Caithness, J. E. S.	8672	Bett, D. L. G.	6546
*Musin, F.	8054	Coventry, E. B.	6546
*Pelly, C. B. R.	7762		

* These candidates have received marks for military efficiency.

PASSAGE MONEY FOR OVERSEAS AIRMEN.

The Air Ministry made the following announcement, August 3rd :—

Approval has been given for the extension to August 31st, 1920, of the time within which applications can be lodged for refund of passage money to individuals who came from abroad before September 30th, 1916 (February 15th, 1916, in the case of South Africa), to serve in the war, provided the applicants in question were prevented from submitting their claims previously owing to : (a) their actual engagement in military operations in distant parts of the world since the Armistice, or to (b) incapacity due to wounds or sickness contracted on active service.

All applications must be accompanied by a statement (if possible, certified as correct by the officer commanding the unit), showing the circumstances in which the applicant was prevented from rendering his claim by October 1st, 1919.

MEMORANDUM REGARDING PATTERN OF R.A.F. NURSING SERVICE BADGES.

AIR MINISTRY, July 30th.

1. It is notified for information that new patterns of Uniform and Hat Badges for the R.A.F. Nursing Service have been approved.

These badges are as under :—

FOR WEAR WITH OUTDOOR UNIFORM.—Winged Caduceus of Mercury Badge, surmounted by a crown, made in "all gilt."

FOR WEAR WITH MESS DRESS.— Winged Caduceus of Mercury Badge, as for wear with Outdoor Uniform, but with silver wings.

The position of these badges will be as follows :—

OUTDOOR UNIFORM :

(a) On the lapel of the Norfolk coat. The bottom edge of the badge to be one inch above the inner end of the step, opening on the collar of the coat.

The staff of the badge to be parallel to the inside edge, and midway between the inside and outside edge of the collar.

(b) On the shoulder cape. The staff of the badge to be placed diagonally on the front corners of the cape, midway between the point of the cape and the turn of the band.

MESS DRESS.—As at (b) above.

The above patterns of badges will be adopted as from September 1st, 1920, and in the meantime badges of the old pattern should not be made.

The new pattern badges can be seen on application to E.4.C., Air Ministry, W.C.2.

2. HAT BADGE.—The R.A.F.N.S. metal badges and black mohair bow in front of the hat have been abolished, and instead, the members of the R.A.F.N.S. will wear the same hat badges as officers of the R.A.F., with a plain black mohair band.

G YOUNG,
Squadron Leader for D. of E.

E.4.C.

The Walmer Air Force Memorial.

On Aug. 7th the Walmer Air Force Memorial erected by the Countess Beauchamp was unveiled by Air Commodore C. L. Lambe and dedicated by the Chaplain-in-Chief of the Royal Air Force. The memorial has been erected in memory of fifteen officers of the Royal Air Force who were killed while serving at the local aerodrome during the war. H.R.H. the Duke of York sent the following telegram to the Countess Beauchamp :—

"I am very glad to hear that you are dedicating a memorial for Walmer aerodrome. Please convey to those of the relatives who may be present my sincere and deep sympathy for the sore loss they have sustained in the death of the gallant men who gave their lives for their country and Empire in the service to which I have the honour to belong."

To Ex-Officers of the R.A.F.

An aerial transport company which is organising aerial communications on a serious basis wishes to get into touch with former R.A.F. officers to act as correspondents in the following towns :—Margate, Dover, Folkestone, Dymchurch, Ashford, Headcorn, Chatham, Maidstone, Tonbridge, Tunbridge Wells, Leatherhead, Hounslow, Hendon, and Ilford.

The duties of these correspondents will be to send four telegrams and two telephone messages per day. The correspondents will receive retaining fees and of course all expenses will be paid. Those desirous of co-operating in this work are requested to write to the editor of this paper, marking their letters "A.T. Correspondent."

To N.C.O. Pilots.

It has been suggested that a reunion dinner for N.C.O. pilots and observers shall be held later in the year. Past and present N.C.O.s who would like to be present at such a reunion are invited to write to the Editor of THE AEROPLANE, who will be pleased to put them in touch with one another so that they may form a committee and elect a secretary to make the necessary arrangements.

THE SEPTEMBER RACE.

Now that the Royal Aero Club have decided to hold another race meeting in September the following suggestion for a course is offered. There is absolutely no doubt that a cross-country race during which the machines go out of sight, but during which reports from turning points are continually coming in, is far more exciting and causes more wide-spread interest than does a short cross-country race in which the machines are in sight all the time. To begin with, the mere fact that machines will pass over a suburban garden will draw the occupants' attention to the race far more than any other way, and when they have had time to think of this, or when they realise how exciting the last race looked from that vantage spot, they will probably consider going to the starting and finishing point themselves.

Furthermore, the more people that see the race, whether they pay to see it or not, the better for future races, and, what is more important, the better for the future of aviation, since bringing aeroplanes to one's door, or, rather, just over one's house, is the best possible method of spreading the gospel of aviation. And by what better method could thousands of people be made to see flying than by a race which takes machines over Worthing, Brighton, Eastbourne, and Hastings, four seaside towns which would be at the height of their season in September.

Therefore one suggests a course somewhat similar to the Aerial Derby which could be started at Hendon, thence in order to Brooklands, Worthing, Brighton, Eastbourne, Hastings, Wrotham, Epping, and so back to Hendon. Possibly the machines might make a circuit of some mark boats at each seaside place, or even land at aerodromes there. This latter would be of great advantage to slower machines and machines with a small tankage. The race could be called the "Circuit of the Seaside," a name that would ensure its popularity with the daily and local Press. Possibly, to ensure greater support, it might be produced to Thanet and Southend, and local bodies might help to add interest by giving a prize to the machine that passes their own town first. The course as originally suggested would be just 200 miles long, but with the inclusion of Thanet and Southend it would be increased to about 250 miles.

While the machines are out of sight some form of "Jamboree" could take place, as in the Aerial Derby, with possibly a short pylon race for Avros and D.H.6s. Anyhow, one is perfectly confident that a race of this type would attract far more people and be of far more practical use to aviation than would an out and home short cross-country affair.—G. D.

A PIONEER AVIATOR AND THE ATLANTIC.

Weary of luxury, yet anxious to leave America in its Western isolation, it is becoming a habit with the adventurous to cross the Atlantic in vessels so small that even Columbus would have hesitated before he made the fatal error of discovering the country which "won the war."

On Aug. 9th the 15-ton ketch *Typhoon* arrived at Cowes from Nova Scotia, having covered the 2,158 logged miles between Cape Race and the Bishop's Rock in 15 days 9 hours and 25 minutes. One of the three on board was Mr. Frederick Thomas Baldwin, manager of Dr. Alexander Graham Bell's (inventor of the telephone) laboratory. The ketch itself was built on Dr. Graham Bell's estate in Cape Breton, Nova Scotia.

Mr. Baldwin will be remembered as one of that talented party of four—the others of which were Dr. Graham Bell, Mr. Glenn Curtiss, and Mr. McCurdy—who designed, built, and flew in 1908 and 1909 the Red Wing, White Wing, June Bug, and Silver Dart series of biplanes. Over the ice of Baddeck Bay, Nova Scotia, and over Bras d'Or Lake, in the winter of 1908 and in February and March of 1909, a total of not less than 1,000 miles was flown on the Silver Dart by Mr. Baldwin and his friend, Mr. McCurdy. In the history of effective flying they come next in precedence to the Wright brothers, if one excludes the many short flights made in France by Henri Farman, Louis Blériot, Léon Delagrange, and others.

"Reliability and Regularity of Service involves the use of . . . high speed machines."

Extract from report of Government Advisory Committee on Civil Aviation.

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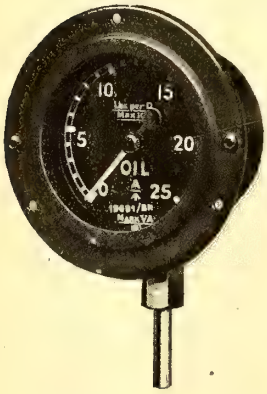

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THE WEEKLY COMMENTARY.

In the columns below will be found some notes on the very interesting exhibits which appeared in the gallery at the Aero Show. These notes do not pretend to deal exhaustively with the subject.

They are intended rather to give an idea of the thoroughness with which research into the factors which make for safety in aeroplanes, and the processes of inspection to secure satisfactory materials, structural design and workmanship in British-built aircraft have been organised and carried out by those departments of the Air Ministry which are charged with such matters.

Particularly excellent were the representatives of A.I.D. in charge of their Department's exhibits. Their willingness to supply all information called for, coupled with a refreshingly accurate knowledge as to the exhibits, made this part of the Show a delight to those of an inquiring turn of mind.

Mr. Hildesheim contributes some notes on the history of the German Aviatik firm and on the development of Aviatik aircraft.

An account of the work carried out in Sweden by the P.O. Flygkompani, in addition to its interest as a narrative, gives some useful information as to the technical difficulties encountered in the use of aircraft in an inclement climate and a district far removed from repair facilities.

THE AIR MINISTRY EXHIBITS AT OLYMPIA.

Of the exhibits which filled the gallery at Olympia, all of them contributed by the Air Ministry, that staged by the Aeronautical Inspection Department illustrative of the tests and measurements made during the process of manufacture of both aeroplanes and aero engines was extremely interesting and instructive.

The first exhibit in this section, actually a contribution from the R.A.E., showed the skeleton of a Sopwith "Camel" inverted upon trestles and with its wings loaded for a strength test.

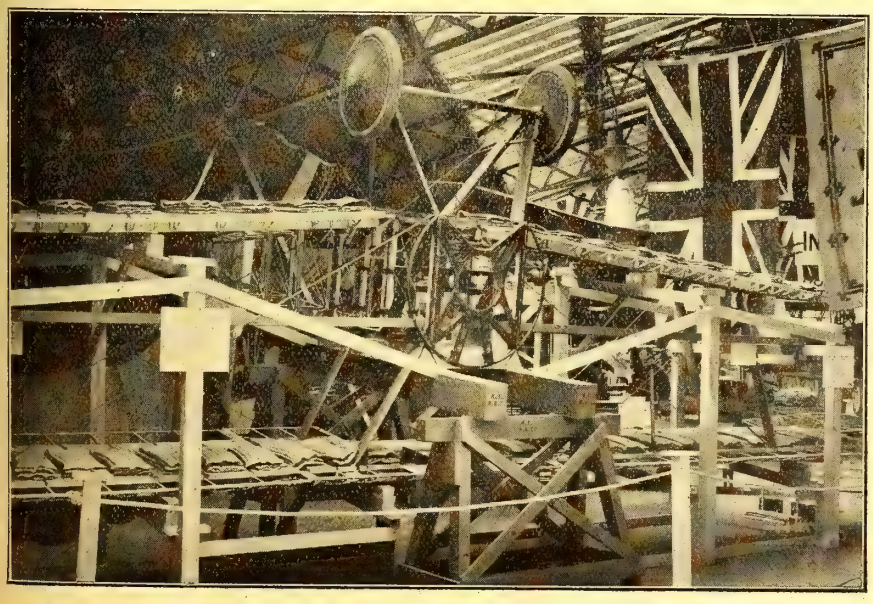
This is shown in a photograph which illustrates the method of support of the fuselage and the method of loading with quilted bags of lead shot of standardised weight.

The next exhibit showed the measurements made to ensure accuracy of trueing up. In this case the machine was a Bristol "Fighter," blocked up to the trueing-up position, and equipped with plumb bobs, incidence gauges, and the like instruments, and with tapes illustrative of the numerous measurements which compose the routine of erection checking. After these familiar sights there were to be discovered numberless special instruments, gauges and jigs devised for the securing of accuracy in the manufacture of the components of aeroplanes, aero engines and airscrews.

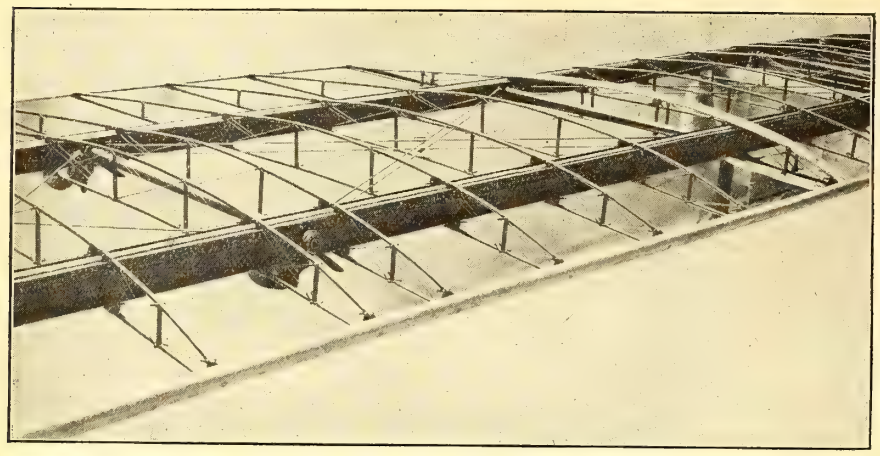
Of the importance and the volume of this checking work in the late war one may judge by the presence among the A.I.D. exhibits of two balances expressly designed for checking the weights and the balance of the cylinders of rotary engines and of the connecting rods of engines generally.

It is fairly obvious that such measurements could be carried out on small quantities of parts by the use of normal weighing appliances of adequate sensitivity. That it should have been worth while to devise and build the complex instruments exhibited shows how great an amount of this work must have been necessary and how thoroughly it was carried out.

Many of the gauges devised for checking the dimensions of engine parts were extremely ingenious. One in particular was designed to secure that an internal and an external key-



The inverted skeleton "Camel" with its wings loaded with shot-bags, in the gallery at Olympia. Note the beams arranged under the wing spars to support them when they do fail, so that the structure shall not be so damaged by falling, if it does collapse, as to obscure the original point of failure. These beams clear the lower surface of the spars by about an inch, so that when failure occurs the collapsed portion only has that distance to drop.



The All-Steel Avro Wing, designed and built at the R.A.E. The spars are of corrugated steel strip, riveted to form a box section. The ribs are built from "close-joint" steel tube of about 5/16 in. diameter, and are wire cross-braced. The leading edge is of C section rolled strip, and steel tube drift struts are used between spars. It can just be seen in the photograph that the lift wires are attached to saddle pieces which pass round the spars and are attached by large-diameter hollow bolts passing through the neutral plane of the spars.

way in one particular engine component were accurately set at their intended angle one to another.

This gauge consisted of two blocks of steel, each one half of the same cube. Each half was bored to be a snug fit on one end of the component in question. One half in addition was bored right through and into this orifice was fitted a keyed plug which projected into the component and engaged in the internal keyway.

The other half possessed a slot, in section similar to the plan form of the external keyway, through which there passed a long fitted plug to engage in this keyway. With the plug in place and entering the external keyway, provided that the two keyways are properly located, the two halves of the gauge formed a perfect cube. Any error in location resulted in the two halves of the cube being twisted relatively one to another, and a very small error could be detected by touch at the joint between the two.

If the location were correct the joint could not be felt, but the least twist resulted in a slight break in the surface and the projection of a sharp edge.

Extremely interesting also were certain sectioned blocks of cylinders showing the "innards" of an actual engine in their working positions.

Photographs of two of these—a Hispano-Suiza block of four cylinders, and a Siddeley "Tiger" block of three, are reproduced.

These two engines show certain features in common. The cylinder block castings of both are of aluminium, with steel cylinder liners. In the Hispano-Suiza the liner is supported over its whole working length by the aluminium casting into which it is screwed, and the cooling water is in contact with the aluminium alone.

It is known that owing to the different expansion coefficients of the steel liner and the aluminium casting complete contact can only occur at some one temperature, and the sectioned cylinder clearly showed that this temperature was not that of Olympia.

It can be seen in one of the photographs of the "Tiger" block that in this case the steel cylinder is screwed only into the head casting, and the aluminium block casting which is bolted thereto forms only the outer wall of the jacket. There is therefore no possibility of an air space intervening between the barrel and the cooling water.

In the Hispano-Suiza engine the cams operate directly upon the tabular valve stem heads, and the valve stem is large in diameter to give ample bearing surface to take the side thrust of the cam, and hollow to reduce weight.

In the Siddeley engine the same features are found in the two inlet valves, but since it would be impossible to fit three valves per cylinder, all directly under the centre line of a common camshaft, the exhaust valve is operated through a rocker arm.

Both these examples show the extremely complicated nature of the castings which modern aero engines call for, and give some idea of the difficulties which beset the inspector called upon to determine whether such a casting is correct or not.

A further very interesting section was that devoted to airscrews. Here airscrews in all stages, from the rough laminations, through the glued up, the carved, the filled, fabric tipped and polished stages to the final test to bursting on a spinning tower could be seen.

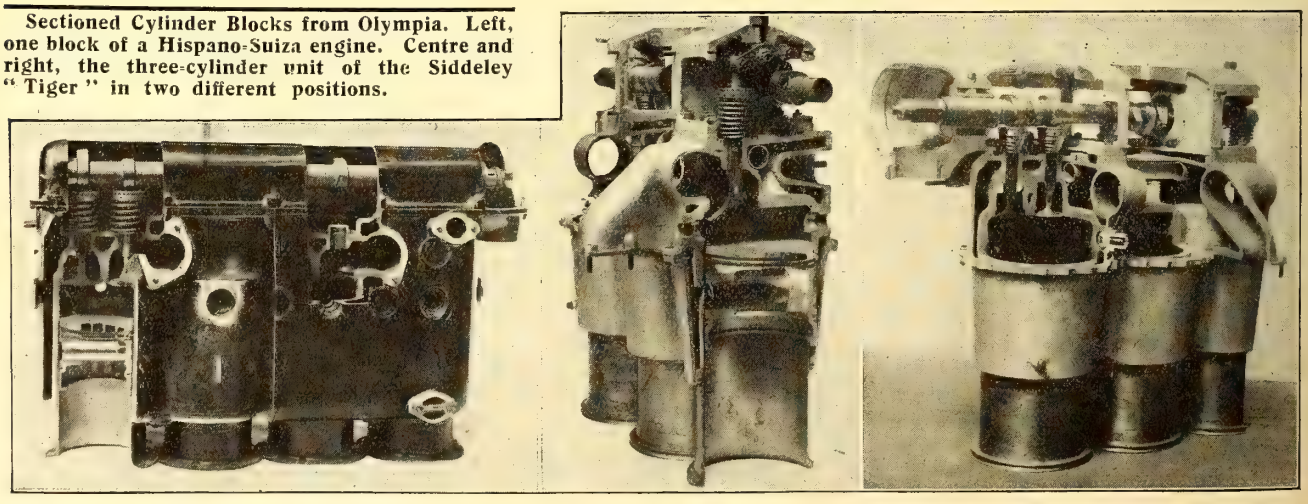
Further, instruments for checking blade shapes and angles, and for testing balance were to be found, together with samples of all the more common defects to which airscrews are liable.

The application of X-rays to the detection of flaws in the interior of either materials or of finished parts was shown by a number of radiographs. One of these showed the interior economy of a certain box rib, and revealed the fact that a wooden packing block supposed to fit tightly between top and bottom laths of the rib actually failed to touch either with more than line contact, and also that certain tacks had split the wood whereinto they were driven. It would have been impossible to determine otherwise whether or not the block existed at all, let alone whether it fitted properly, after the rib had been built, and it seems highly probable that in the future this method of peering into the interior of such parts to detect such cases of dishonest work may assume a great importance.

Of instruments for testing and examining materials there were large numbers, practically all of them already known to general engineering practice, but evidencing by their number and variety the very wide range of material which goes to the making of the modern aeroplane.

Among the miscellaneous exhibits in this section was one very interesting type of all-steel wing, designed and built by

Sectioned Cylinder Blocks from Olympia. Left, one block of a Hispano-Suiza engine. Centre and right, the three-cylinder unit of the Siddeley "Tiger" in two different positions.



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the R.A.E. at Farnborough. The photograph gives a very good idea of the form thereof.

The spars are steel boxes, formed out of corrugated strip of thin gauge in what has now become practically a standard method. The rib structure is particularly interesting. It will be seen that the ribs are steel tube girders with wire cross bracing. From the point of view of economy in weight this is probably the best solution of the metal rib yet devised, but it seems highly improbable that, in such small sizes as this (the example is designed for a standard 504 K type Avro) such a structure can be produced at a reasonable cost. One irrepressible humourist described the exhibit as the "R.A.E.'s imitation of God making flies."

At the same time it must be remembered that experimental work is much better commenced on a modest scale, and that demonstration that a satisfactory wing of the type is possible in small sizes is an essential preliminary to embarking on the design of much larger wings, and that for deep wings of great chord this form of rib will probably be fairly cheap to construct.

Another product of the R.A.E. was the "Fireproof" Avro. This was the fuselage of an Avro, fitted with an A.B.C. "Wasp" engine, wherein all possible precautions against the spread of fire from the engine, *via* the carburetter back into the fuselage and so to the tanks, had been embodied. In the scheme adopted there was nothing of startling novelty, but in the thoroughness with which the scheme was carried out there were many object lessons to the designer of engine installations.

A very complete range of instruments for both the purposes of straightforward navigation and for test flying were on view.

Of these one of the most interesting, and certainly one of the most simple, was the R.A.E. turn indicator. This depends for its operation on the well-known fact that if a spinning gyroscope is forced to change the direction of its axis of rotation in any one direction it immediately attempts to also change the direction of that axis in a plane at right angles to the enforced movement.

The turn indicator is a small diameter flywheel, carried in bearings on a trunnion. The axis of the wheel is set parallel to the line of flight, and the trunnion carrying the bearing is free to turn against a spring round an axis athwart the machine. If the machine turn, and the flywheel with it, the gyroscope forces the trunnion to turn in its turn and so rotates an indicating needle on the instrument board.

Rotation of the gyroscope is attained by cutting inclined holes through the wheel itself and expositing it freely to the wind, and the whole mechanism is of the simplest possible.

AVIATIK AEROPLANES.

By Erik Hildesheim

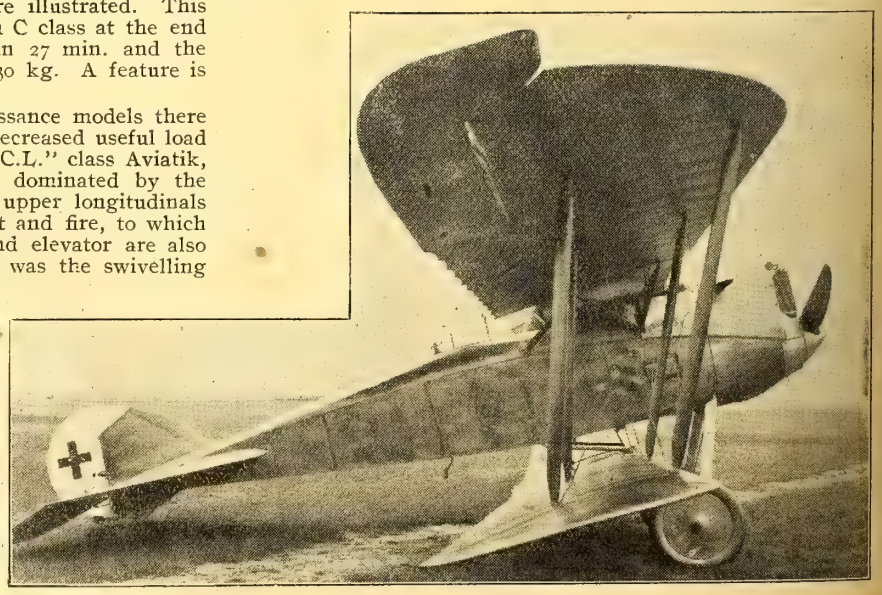
The Aviatik Type C VIII Two-Seater, with the 230-h.p. Benz Engine. This was the best of the German general purpose two-seaters to see service during the war, and the cleanness of outline is noticeable. The lower wing passing beneath the body is reminiscent of the Bristol Fighter, but differs in that the wing is made in one piece, as is the upper plane. The arched fuselage line of the Bristol may also be observed.

Aviatik aircraft have the questionable distinction of being, after the Taube, the first type discovered by name by the daily Press during the war.

The Automobil and Aviatik Co., Ltd., may be remembered as one of the earliest German aircraft works, starting with the manufacture of Henri Farman box-kites and Hanriot monoplanes, and eventually producing an Arrow tractor biplane which, flown by Stoeffler, scored first prize in the national German 24-hours' overland flight in 1913. During the war this C.I two-seater, of 142 k.p.h. and 3,000 m. climb in 36 min. with 450 kg. useful load, equipped with a 160-h.p. Mercédès engine, developed through increasing power units to the 230-h.p. Benz-engined C.VIII, here illustrated. This had the best performance of the German C class at the end of the war. The climb was 6,000 m. in 27 min. and the ceiling 6,580 m., with a useful load of 430 kg. A feature is the one-piece planes.

Contemporary with the heavy reconnaissance models there were produced light two-seaters with a decreased useful load of 360 kg. The appearance of the first "C.L." class Aviatik, powered by a 180-h.p. Argus engine, is dominated by the bending down of the top planes to the upper longitudinals to afford the gunner a free field of sight and fire, to which end the control cables of the rudder and elevator are also placed inside the body. Another feature was the swivelling of the gun-ring round the centre line, thus enabling vertical firing through holes in the fuselage.

In the scout class three Aviatik products were turned out during the war, viz., the D.II, D.III, and D.VI, of which the latter is shown. The former was equipped with a 160-h.p. Mercédès engine and climbed with two fixed guns, a useful load of 195 kg. and a flying weight of 870 kg. to 5,000 m. in 20 min. The D.III with the 195-h.p. high-speed gearless Benz was a reply to the Spad-Hispano mount, and the D.VI had by the time of the Armistice been selected as the best craft for the super-dimensioned 8-cylinder Vee-type Benz



An Aviatik of the C (two-seater) class) fitted with the 230-h.p. Benz Engine. This machine has the air of being a larger machine than the C. VIII above, and is fitted with two-bay wings and balanced ailerons.

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The Aviatik C.L. Class Light Two-Seater with the 180-h.p. Argus Engine. Note the rigid wing truss and the dropped upper centre section, giving the pilot an excellent fighting view

with reduction gear. The twin row of struts with cable wiring was revived so as to reduce vibration of the greatly overhanging wing-tips. The performance was 6,000 m. climb in 23 m.in. and a ceiling of 7.550 m.

The Aviatik Company also took up the production of giant aircraft, producing first under licence the Gotha twin-engined bomber G.VIII and later the Staaken multiple-engined R craft. In the original Zeppelin products the power plant was four side engines in tandem pairs and one tractor engine in the body nose; but the Aviatik firm fitted the interplane power eggs with 220-h.p. Benz tractors and a 530-h.p. 12-cylinder engine of the same make for the pusher drive. These 1,500-h.p. Aviatik-Staaken giants were thus the highest powered aircraft in service on the German side at the end of the war.

From the experience thus gained the building of a 2,000-h.p. giant was started upon in 1918, but its completion was interrupted by the revolution. This machine was of the central power plant type and instituted yet another solution of the engine arrangement problem. The four 12-cylinder Benz engines of 530 h.p. each are mounted athwartship side by side and each drives its own screw through a transmission shaft. Two of these are tractors and two pushers.

The engines are started by compressed air from the mechanics' position. The petrol tanks, of 8 hours' capacity, are bullet- and fire-proof, carried below the engines. Radiators are mounted in the slipstream of the tractor airscrews.

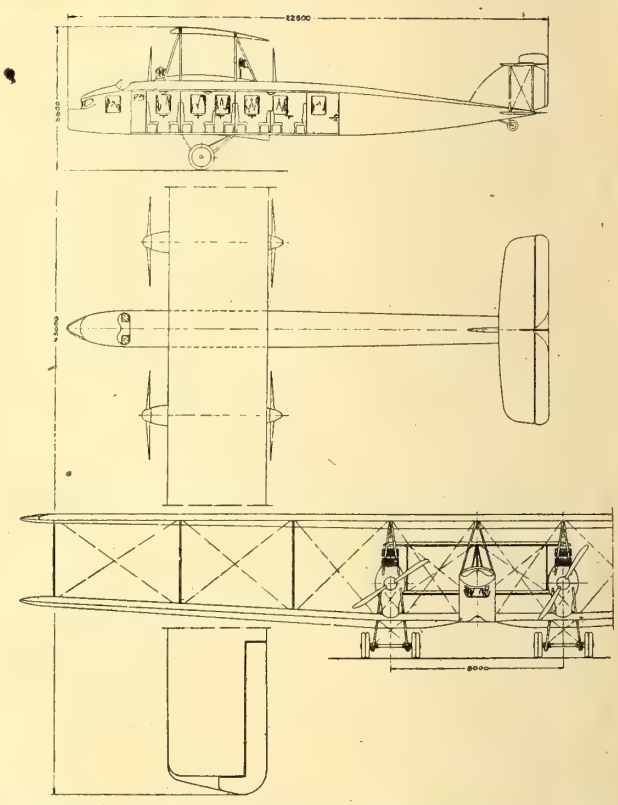
The wing arrangement is a triplane with extreme stagger of the middle one in regard to the top and bottom ones, an arrangement based upon research work at the Göttingen wind tunnel.

The main dimensions are 55 m. span by 27 m. overall length and 8.5 m. maximum height. Including 6 hours' fuel, the useful load amounted to 7 tons. The estimated performance was a climb to 5,000 m. in 2 hours and a speed at 3,000 m. of 145 to 150 km.

The fuselage accommodation starts at the nose with an open platform for the captain, next an enclosed navigating position. Then follow the open cockpits for two pilots, with the wireless compartment below. The engine-room is separated off by a bulkhead.

The longitudinals are built-up hollow spars and the cross-members of tubes, as are the engine mountings. The undercarriage is steel sprung and the wheels rubber, wooden, or steel tyred. As in other giant aircraft, the tail-skid has been replaced by a sprung wheel undercarriage, which is steerable.

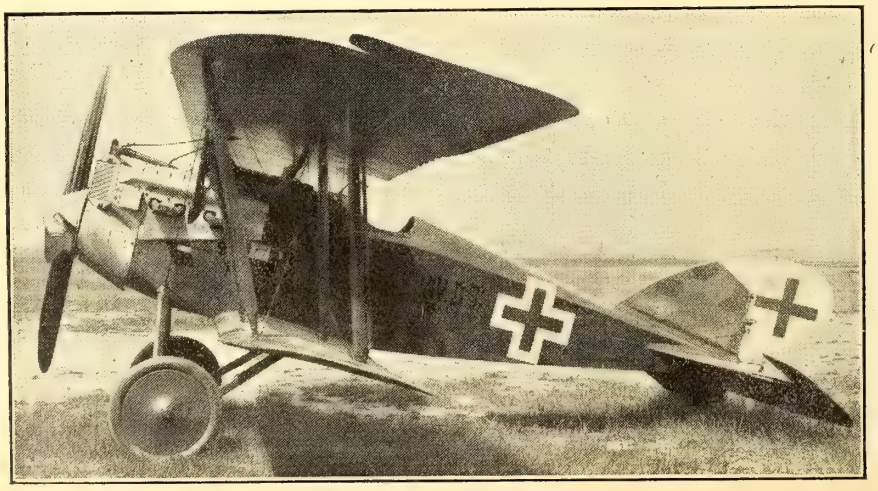
The wireless equipment comprises dynamo, sender and receiver, and the instrument-board and navigator's post resembles those of airships. The lighting is electric, current



The Aviatik 1,000-h.p. version of the Staaken "Giant," revised for passenger-carrying.

being supplied from the wireless dynamo. Electrical order transmitters, an engine-room telegraph, and a mail dispatch tube are fitted. Each person is provided with a parachute, stowed away but easily accessible.

For civil use after the Armistice the Staaken 1,000-h.p. giant, with two interplane power eggs, housing four 250-h.p. 6-cylinder Benz engines, has been adopted. The performance of the specimen turned out has been a total useful load of 3.6 tons, being 7 hours' fuel, the crew of six men



The Aviatik D.VI Single-Seat Fighter. This, fitted with the 8-cylinder Vee-type Benz engine with reduction gear, never reached the war, but if appearances are taken into account it looks as though it would have given an excellent account of itself had hostilities continued.

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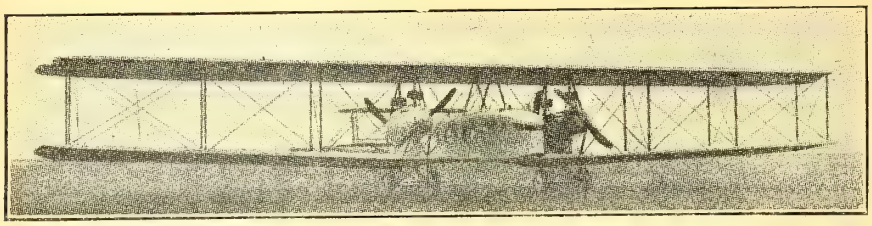


The Aviatik Commercial Giant fitted with four 250-h.p. Benz Engines, two in each power egg. A modified Staaken Giant.

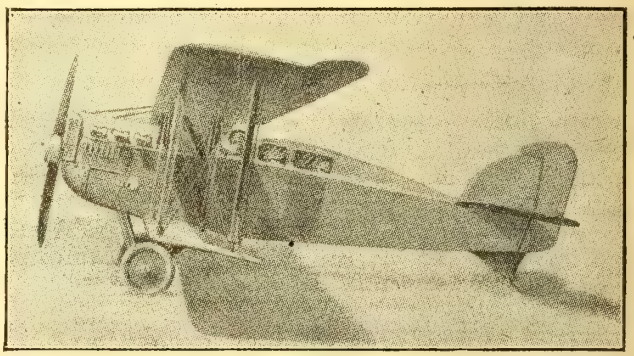
and 18 passengers with their luggage. A speed of 125 k.p.h. is attained.

This civil model is like the bomber type, with wings of 22.5 m. span and a twin-strut biplane tail of 9 m. span, with divided top elevator. The interplane power eggs are slightly changed, as the engine cowling goes to the bottom planes and encloses the petrol tanks, two of which are provided for each engine. Altogether the wing engine installation has been preferred as the best for passenger-carrying. The engine vibration and the noise caused thereby is reduced, as is the danger from carburetter fires.

Double planking of the body is used at the passenger cabin for heat insulation. The luggage compartment is above the passenger cabin, with easy access through hatchways.

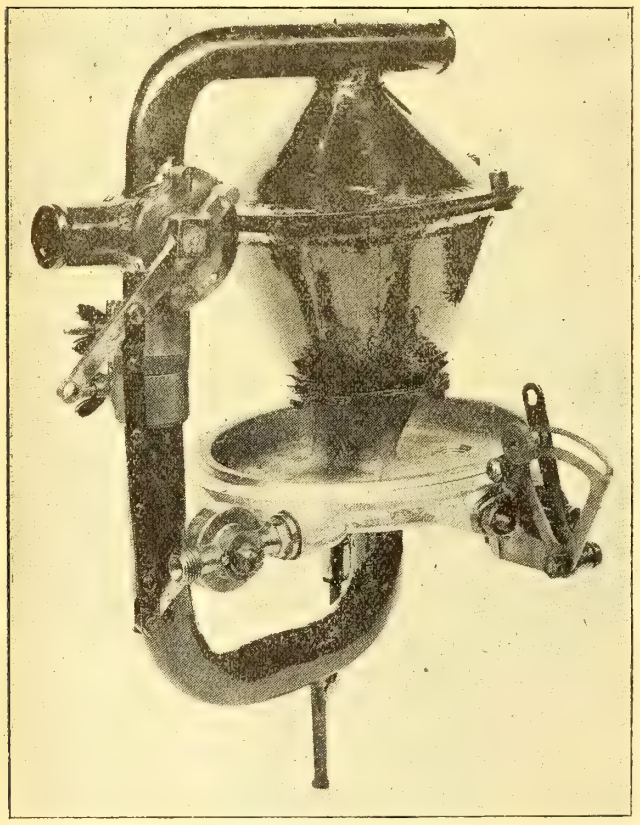
For express mail and passenger service the commercial type F has been developed from the scout model D.VII, with the main difference that a 12-cylinder 320-h.p. Vee-type Benz engine is used to give a greater speed than can usually be attained by this type. A four-bladed airscrew is driven through a reduction gear and a speed of 175 to 180 km. attained. Fuel for 3 hours is carried, and as the total load is 565 kg., 250 kg. of mail, passengers and their luggage are carried.

The limousine has ample seating accommodation for two or three passengers and the roof can be removed, turning the cabin into an open cockpit. The span of the twin-celluled slightly staggered limousine biplane is 15 m. and the length 7.9 m.

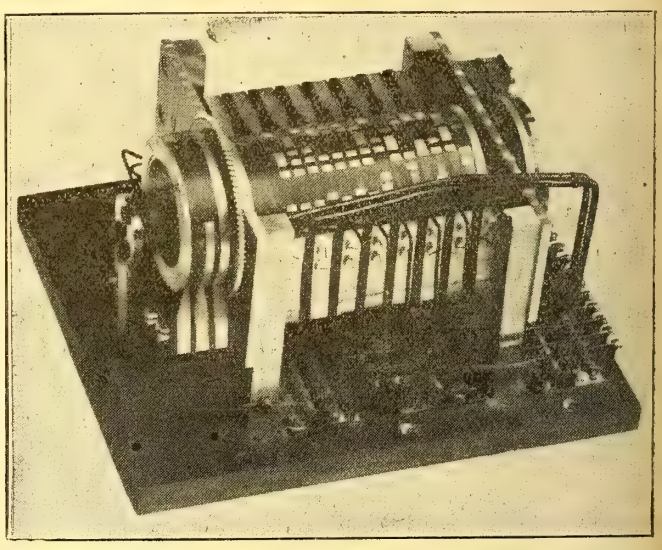


The Aviatik Limousine, Type F, fitted with a 12-cylinder Benz Engine of 320 h.p.

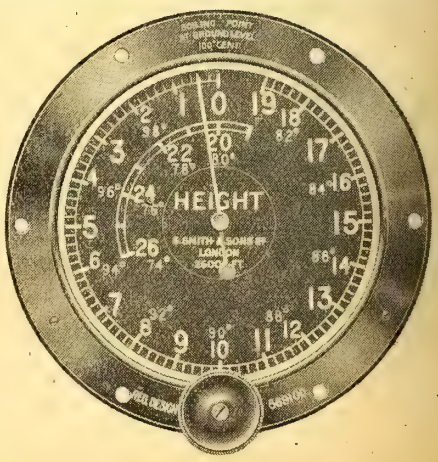
FROM OLYMPIA.



The Vaporiser of the Napier Gas Starting Device fitted to the 450-h.p. "Lion" Engine. On the left may be seen the inlet from the air pump and the two-way valve which allows either clean air to pass through the upper pipe to the cylinders, or diverts the air through the vaporiser by the pipe entering at the base thereof and so charges the cylinders.



The Contact Drum of the Automatic Telegraph Co.'s Aircraft Wireless Transmitter. The dot and dash contacts which transmit the Morse version of the coded signals can be plainly seen.



The new Smith "Boiling Point" Indicator. An ordinary altimeter with, engraved alongside the scale of height, a scale showing the boiling point of water. With this and a radiator thermometer the pilot can see at once how close to boiling is his radiator.

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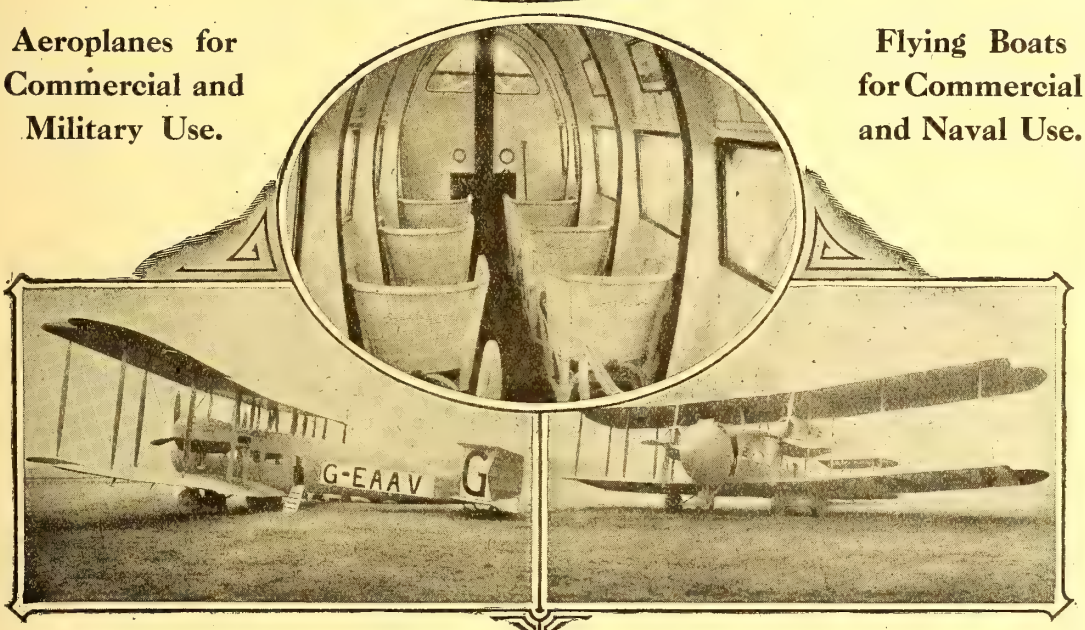

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RECENT DEVELOPMENTS IN SWEDEN.

Very good work has been done during the past year by the P.O. Flygkompani, of Barkaby, Sweden, both as work and as an advertisement in Scandinavia for British aircraft and aviators.

Capt. Saunders, of the P.O. Flygkompani, completed a most extensive tour of Sweden, North and West of Stockholm, on April 20th.

The tour started at Christmas, and was continuous. He had in use the same Avro all the time, flying on skis, continuously, in all conditions, plain ice, and deep snow, and, towards the end, snow and water. He visited upwards of sixty places, and at the last place alone, Lulea took 52 passengers. The intense interest for flying in North Sweden can be gauged from the fact that two machines belonging to the P.O. Flygkompani took up 109 passengers in Lulea in the week.

Capt. Saunders' tour can be looked on as a milestone in Swedish aviation and is an incredibly fine performance which can only be appreciated properly by one who has flown over the same country, but in a far bigger machine with a more reliable engine.

A WONDERFUL RECORD.

Lieut.-Col. G. L. P. Henderson left Stockholm for Karlstad on March 7th and flew thence by stages to Lulea, taking up 650 passengers (with slight assistance from an Avro for two weeks) in five weeks. Thirty-five towns were visited. The machine was a standard Fairey 3A, driven by a Rolls-Royce "Eagle," and fitted with skis, which were never changed throughout.

On only three days out of 37 no flying was done—once for a rest, once on account of weather, and once owing to bad ice. No engine trouble was experienced whatsoever, and no journey was uncompleted from any reason whatsoever, except one, when a landing had to be made through a snowstorm. Machine repairs were confined to one tail-skid, which had to be re-shod. The distance covered on this tour was approximately 6,000 miles (80 hours at 75 m.p.h.).

LATER WORK AND PLANS.

Both the Avro and the Fairey were sent by train to Stockholm from Lulea (600 miles). The Fairey emerged as a seaplane from the P.O. Flygkompani's works in exactly ten days and started the Finland-Sweden route three days later. This flight has now been accomplished three times, with one flight from Stockholm to Sundvall and back in between, and the usual passenger carrying on Saturdays and Sundays.

An Avro seaplane and a second Fairey seaplane were launched soon afterwards.

With three seaplanes and two land Avros, and three D.H.6s employed in school work, and an A.W. and five pilots, a very complete summer programme is prepared.

In addition, a "Guardian Angel" parachute has been procured, and Major Orde-Lees has done several very educative parachute descents.

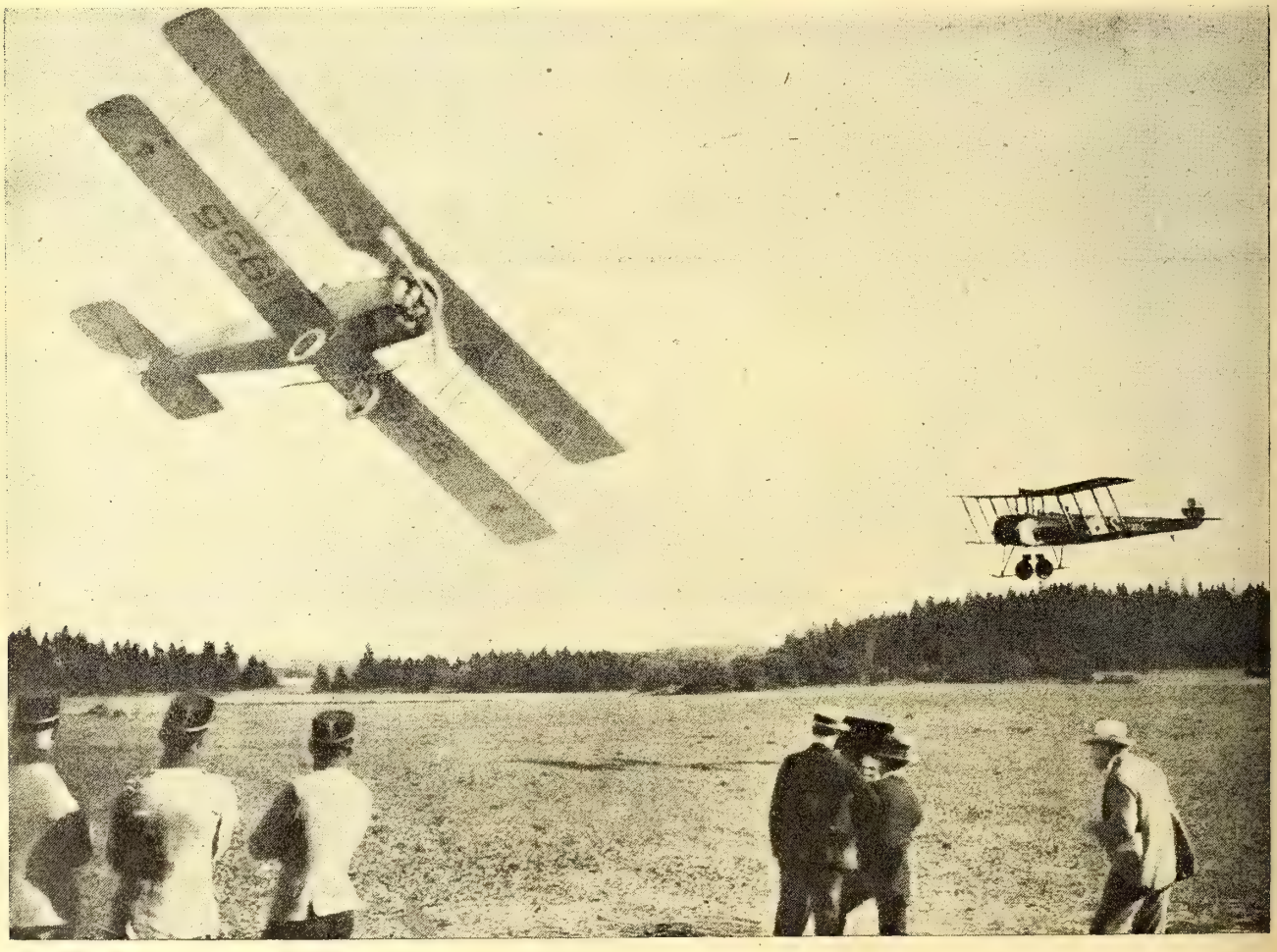
REAL WORK.

Just to show what can be done by keen mechanics working with interest in their jobs and with enthusiasm for aviation, the following account by Lieut.-Col. G. L. P. Henderson of certain work done to his "Fairey" biplane in Sweden recently is worth recording. It will doubtless be of considerable interest to R.A.F. officers and to people running air transport lines and joy-ride concerns with ordinary "standard type" mechanics :—

"The Fairey arrived on train from the North (dismantled) on Monday, April 19th. We (1) unloaded, (2) removed the engine, (3) fitted another engine, (4) repaired a radiator, damaged in transit, (5) repaired planes and fuselage where damaged by passengers and by the railway, (6) redoped one plane, (7) repainted fuselage, planes, tail and engine, (8) fitted a ladder, (9) redesigned and constructed wind screens (for passengers), (10) renewed control cables, (11) fitted special direct coupled starting magneto, (12) changed position of dope pump, (13) ditto radiator shutter control, (14) ditto rudder controls, (*a*) to enable one man to start motor from floats single-handed, (*b*) to make room for a passenger beside the pilot, (15) re-rigged the machine, (16) tested machine and engine.

"Total time from Monday, 19th, at 12 midday, until Thursday, 29th, at 6 p.m.

"Then on April 29th (same day) we flew to Stockholm, folded machine, towed it by road to docks and left it for the night.



AN EXHIBITION.—Swedish officers watching Major John ston and Capt. Saunders give an exhibition of flying on Avros for the photographer of the Swedish newspaper, "Sport."

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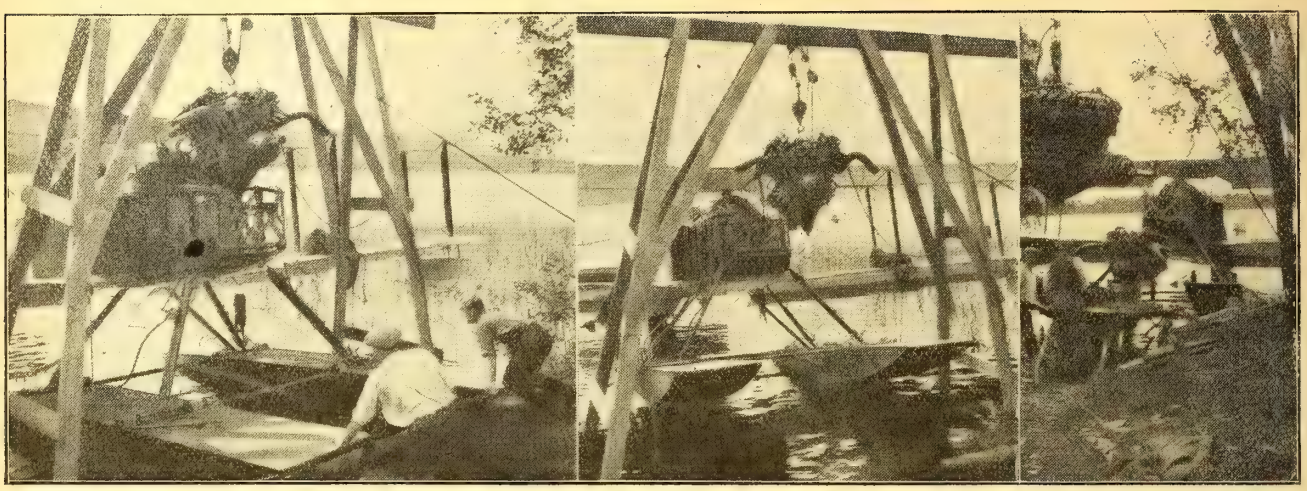
Telegrams:
AIRCRAFT, 141 YEOVIL.



WORK UNDER DIFFICULTIES.—Changing Rolls-Royce Engines on Lieut.-Col. Henderson's Fairey Seaplane.

"Friday, 30th, machine was fitted with float undercarriage, tail and wing floats and necessary fuselage coverings at rear end, water rudder, etc.

"Saturday, May 1st, midday, machine lowered into water by a crane, two test flights made.

"Sunday, May 2nd, machine in commission as a seaplane, taking passengers.

"Wednesday, 5th, machine flew to Finland, returning Sunday, 9th, again.

"Time taken by four mechanics, including myself, to give a top overhaul to an 'Eagle VIII' engine, including removing all cylinders, magnetos, carburetters, grinding valves, cleaning pistons, and replacing everything—24 hours from a Friday, 5 p.m., till Saturday, 5 p.m. (This same engine took me to Finland and back)."

Traffic Troubles.

Flying low across the Baltic, either when facing a strong head-wind, or flying in a fog, is somewhat complicated by the necessity for following the channel marks, which are posts about twelve feet high. The Aaland Islands are absolutely innumerable and all exactly alike, so that unless visibility is good, or unless the pilot flies a compass course, it is quite impossible to find one's way among them. Therefore the temptation is to fly at about six feet above the water, following the ship channel as marked by the aforesaid posts. The difficulty of estimating one's exact height above the water involves a certain liability to a sudden meeting with one or another of these posts.

Sweden's First Big Flying Show.

On June 6th the P.O. Flygkompani held a very successful flying meeting at Stockholm which turned out to be the biggest of its kind yet held in that part of the world

At 2.30 p.m. the machines, piloted by Lieut.-Col. G. L. P. Henderson, Major Johnston, Capt. Saunders and Lieuts. Park and Hamilton-Youell, flew in formation from Barkaby to Stockholm, which was reached at 2.45 p m.

The machines were then lined up and the pilots were presented to the King of Sweden, after which he inspected the machines, which consisted of one 160-h.p. Ack-W., two D.H.6s., three Avros and one Fairey float seaplane in the harbour. The King was also shown the "Guardian Angel" parachute.

At this point four Swedish army pilots were booked to join the show, Lieut. Segebäden on a 230-h.p. Phönix scout, and Lieuts. Sjöholm, Klintberg, and Adilz on S.18s (260-h.p. Mercédès), which are heavy two-seaters built at Malmslätt, and are similar to the one on which Lt. Rodelm made the longest flight on record in Sweden.

One pilot damaged his undercarriage and had to drop out, and Lieut Klintberg, who landed tail to wind with a spluttering engine, turned over on his back. Lieut. Segebäden, however, put up a good show on the Phönix and put the Swedish pilots up a good deal in the public's estimation, although, on landing, he was unfortunate enough to damage a wing slightly.

The next item on the programme was a little formation flying by the Avros flown by Johnston, Saunders and Park, which ended up with a steep dive in formation and a hoik-up, after which followed the usual stunting. The next affair proved to be the sensation of the day, when Major Orde-Lees jumped off a float of the Fairey at 1,200 ft. with a "Guardian Angel" parachute and landed smoothly within a hundred yards of the Royal party.

An air race, in which the two D.H.6s and three Avros participated was the next item. This was won by Capt. Saunders on an Avro. After the race the Avros carried passengers, 26 being taken up.

At 1 a.m., with the sun just rising, a return was made to Barkarby. Considering the whole show was flown from a road which was the only place available the meeting proved to be a great success, both from the point of view of the lack of damage to machines and the large amount of interest it created, fully 40,000 people looking on. The gate goes to the Stockholm Aero Club, whose finances are on the ebb.

THE P.O. FLYGKOMPANI OF SWEDEN.—From left to right, Major Orde-Lees, Lieut.-Col. G. L. P. Henderson, Lt. P. O. Herrström, Capt. K. F. Saunders, Major C. R. Johnston, Lieut. Hamilton-Youell, and Lieut. Park.

Beardmore

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Avro 5-seater Triplane.

Sporting Short Seaplane.

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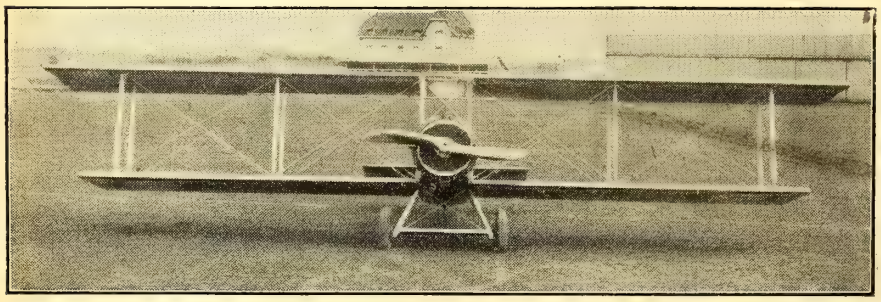
Aeronautical Engineering says of the latter "By using two of the 160 h.p. Beardmore Engines a power plant of proved reliability known to call for very low maintenance costs is attained."

AeroEngines

THE NEW BRISTOL "BULLET."—This machine, which made its first public appearance in the air at the Aerial Derby, is here seen in a front view, which gives an idea of the absence of unnecessary head-resistance. Like all the recent high-performance machines of Capt. Barnwell's design, the "Bullet" has a lower wing smaller in chord and in span than is the upper one.

A CASE OF NATURALISATION.

A recent American version of the DeH.4, converted to the uses of the American Mail Service by installing twin 300-h.p. Hispano-Suizas between the wings. In later editions of the type a pair of additional fins, one near each tip of the tail plane, has been fitted.



AN UNCOMMON FRENCH MACHINE.

The Farman F.70, a two-seater intended for high-speed passenger work and fitted with the 260-h.p. Salmson Z.9 Engine. The speed is said to be in the neighbourhood of 125 m.p.h.

THE INSTITUTE OF AERONAUTICAL ENGINEERS.

July Notices.

Council Meeting.—A meeting of the Council was held on July 12th.

Elections.—Honorary Members: Com. Dr. Ginaninni; Col. Milivoye Yoksimovitch. Member: Charles Baxter, M.I.Mar.E., F.R.Met. S. Associate Members: Hector Sleeman; Captain Charles Frobisher, F.R.Met.S.; F. A. Thomas, A,M.I.Mech.E.; Major F. C. Buck; Capt. P. C. C. Passman; Gysbertus Spit.

Foreign, Colonial and Provincial Branches.—The Council has appointed a Branches Committee to deal with matters relating to the promotion of branches at home and abroad.

Employment.—Every possible assistance is being given to members in finding berths, and members desirous of availing themselves of this should communicate with the Secretary without delay.

October Examinations.—Associates and Students who desire to sit for the Intermediate Examination for Associate Membership must make application before August 31st, to the Secretary, from whom copies of the rules of examination are obtainable. Pilots may also sit for the Intermediate, and the Final Examination, qualifying for Membership, will also be held in October.

Financial Year.—The Council has decided that the first financial year shall be considered to end on December 31st, shortly after which date their annual report and balance sheet will be presented.

Monthly Notices.—Members of the Institute who happen to be regular readers of the journal in which these notices appear are requested to notify the Secretary accordingly, so that the unnecessary expense of sending out duplicate copies by post may be avoided in future.

Donations.—The Council gratefully acknowledge the further gift of office furniture from the Nieuport and General Aircraft Co., Ltd., and the gift of a complete set of numbers of *Flight*, commencing with the first issue, from Frederick R. Simms, Esq.

60, Chancery Lane, W.C.2 Douglas Shaw, Secretary.

AERO ENGINES AT SEA.

The eliminating trials to decide upon the team to represent Great Britain in the contest for the International Trophy for motor-boats was held on Osborne Bay on Aug. 4th.

The entrants were: Maple Leaf V (1,800-h.p. Sunbeams), Maple Leaf VI (1,100-h.p. Rolls-Royce), Sunbeam Despujols II (900-h.p. Sunbeams), Sunbeam Despujols I (450-h.p. Sunbeam), Tyreless V (Green engine), and Miranda V (475-h.p. Thorneycroft). Thus all the engines except that of the last-named entry were aero engines.

Sunbeam Despujols II failed to start, owing, it is reported, to shipping a sea which drowned out her magnetos, and Miranda V gave up shortly after the start. The remaining four—all aero engines—completed three rounds of the course of 6.617 nautical miles, with less than six minutes difference between fastest and slowest. The trials were carried out in very heavy weather, and afforded an excellent test of both hulls and engines.

The two Maple Leafs have been definitely chosen for the British team, and the third boat will be selected later.

DOPE.

One is told that there has been a certain amount of trouble recently with aluminium dope owing to fabric treated in this way not retaining its strength. As this colour dope is now to be adopted as standard by the Royal Air Force for all Service machines, and also as it seems to be the usual application on machines employed on the commercial air lines, the question of a lasting aluminium dope that is durable becomes most important.

It is therefore interesting to note that Cellon aluminium dope was used on the Vickers "Vimy" belonging to the Instone Air Line, and though this machine has been in use for some months and has been out in all weathers, the dope and fabric still are as good as new.

Incidentally Cellon (Richmond), Ltd., have just received a further large order for dope from the Spanish Government to keep them going until the Spanish works are in full blast. Amongst other foreign Governments recently supplied are those of Greece and the Argentine.—G. D.

A TANK-FILLING CHALLENGE.

It has come to the notice of Pettett's Patent Safety Filler Co. that some of their competitors claim for their device greatest economy, safety, and time-saving. As the inventor of the Pettett's Patent Safety Filler, Mr. Pettett wishes to issue a challenge (for any sum from £5 to £50, to be paid to the Motor Trade Benevolent Fund) to any one device which can beat his on time, safety, or economy.

The firm wish to make it quite clear they are in no way desirous to profit by this, but only to place absolute facts upon record so that their claims can be fully justified

The Original NON-POISONOUS.

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FIRTH'S NICKEL CHROME STEEL.

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It is uniform in quality, and can be relied upon to be free from hard spots and internal and surface defects.

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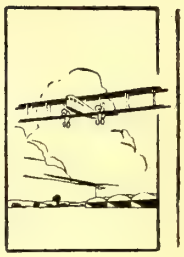

OFFICIAL NOTICES.

NOTICE TO AIRMEN, No. 84.

AIR MINISTRY, Aug. 7th.

It is hereby notified:—

Pilots and others using the London Terminal Aerodrome at Croydon, Surrey, are warned that certain construction work is in progress on the aerodrome.

It is dangerous, therefore, for machines to land on or taxi across these parts of the aerodrome.

"Danger" areas are marked by flags during the day and by white lights at night.

NOTICE TO AIRMEN, No. 85.

AIR MINISTRY, Aug. 7th.

It is hereby notified:—

Arrangements have been made for kites and kite-balloons to be flown at the aerodrome at Howden (Yorks.), for the purpose of making meteorological observations.

Pilots flying in the neighbourhood of Howden should therefore keep a careful lookout, as the wire of the kite and the cable of the kite-balloon constitute a danger to aircraft.

In cloudy weather, aircraft should avoid Howden, except when arrangements have been made beforehand with the Air Officer Commanding R.F.A., Airship Base, Howden, for the kite or kite-balloon not to be flown.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
August 2nd	A.T. & T.	DH16	G-EALM	London	Paris	09.45	12.05	Nil	3	Holmes
	A.T. & T.	DH9	G-EAQP	London	Amsterdam	10.15	13.16	Goods	Nil	Forson
	H.P. & M.A.	Breguet	F-CMAB	London	Paris	13.30	16.20	Nil	Nil	Martel
	H.P. & M.A.	Breguet	F-CMAC	London	Paris	13.35	18.00	Nil	Nil	Challaux
	A.T. & T.	DH9	G-EAGY	London	Paris	13.40	16.05	Goods	1	Reeve
	A.T. & T.	DH16	G-EAPT	London	Paris	16.15	18.55	Goods	Nil	Armstrong
	A.T. & T.	DH18	G-EARI	Paris	London	09.25	12.40	Nil	4	Powell
	C. des G.E.A.	Goliath	F-HMFU	Paris	London	12.05	15.45	Nil	3	Labouchère
	C.T.	Nieuport	F-ICGT	Paris	London	12.15	15.05	Mail	Nil	Lasne
	A.T. & T.	DH16	G-EALM	Paris	London	16.55	19.15	Nil	4	Holmes
	A.T. & T.	DH9	G-EAGY	Paris	London	17.20	20.05	Nil	2	Carter
August 3rd	A.T. & T.	DH16	G-EALM	London	Paris	09.45	11.50	Gds&M.	2	Game
	A.T. & T.	DH9	G-EAGY	London	Amsterdam	10.00	12.44	Goods	1	Robbins
	C.T.	Nieuport	F-ICGT	London	Paris	10.35	13.05	Nil	Nil	Lasne
	A.T. & T.	DH9	G-EAQL	London	Paris	10.45	13.15	Goods	Nil	Milnes
	A.T. & T.	DH16	G-EASW	London	Paris	16.50	19.15	Goods	2	Lines
	A.T. & T.	DH9	G-EAQN	London	Amsterdam	18.00	20.05	Nil	Nil	Hinchcliffe
	A.T. & T.	DH16	G-EASW	Amsterdam	London	15.18	08.00	Nil	3	Bradley
						2nd				
	A.T. & T.	DH16	G-EAPT	Paris	London	10.20	12.47	Nil	4	Armstrong
	A.T. & T.	DH9	G-EAQN	Amsterdam	London	12.43	16.00	Gds&M.	2	Hinchcliffe
	H.P. & M.A	Breguet	F-CMAC	Paris	London	12.35	15.30	Nil	2	Challaux
	A.T. & T.	DH9	G-EAQP	Amsterdam	London	15.02	17.55	Nil	1	Forson
	A.T. & T.	DH16	G-EALM	Paris	London	16.45	20.05	Nil	4	Game
	A.T. & T.	DH9	G-EAQL	Paris	London	17.00	19.45	Nil	2	Reeve
August 4th	A.T. & T.	DH16	G-EAPT	London	Paris	09.35	11.55	Nil	3	Holmes
	A.T. & T.	DH16	G-EALM	London	Paris	10.30	12.30	Goods	1	Bradley
	H.P. & M.A	Breguet	F-CMAC	London	Paris	12.00	14.30	Nil	Nil	Challaux
	A.T. & T.	DH9	G-EAQP	London	Amsterdam	13.50	16.30	Goods	Nil	Carter
	A.T. & T.	DH16	G-EASW	Paris	London	09.50	12.35	Nil	4	Lines
	C.T.	Nieuport	F-CGTA	Paris	London	12.25	14.55	Mail	Nil	Hanin
	A.T. & T.	DH9	G-EAGY	Amsterdam	London	15.11	17.50	Gds&M.	Nil	Robbins
	A.T. & T.	DH16	G-EAPT	Paris	London	16.43	18.45	Nil	4	Holmes
	A.T. & T.	DH16	G-EALM	Paris	London	17.40	19.30	Nil	Nil	Bradley
August 5th	A.T. & T.	DH16	G-EASW	London	Paris	05.45	09.30	Gds&M.	Nil	Game
	A.T. & T.	DH9	G-EAGY	London	Paris	12.15	15.15	Goods	Nil	Bamber
	A.T. & T.	DH16	G-EALM	London	Amsterdam	12.23	15.53	Goods	Nil	Reeve
	A.T. & T.	DH16	G-EAPT	London	Paris	12.25	15.10	Goods	4	Armstrong
	C.T.	Nieuport	F-CGTA	London	Paris	12.35	16.25	Nil	Nil	Hanin
	C. des G.E.A.	Goliath	F-HMFU	London	Paris	15.00	18.45	Goods	8	Labouchère
	I.A.L.	"Vimy"	G-EASI	London	Paris	15.55	18.40	Nil	4	Barnard
	A.T. & T.	DH16	G-EAPM	London	Paris	17.39	19.40	Gds&M.	3	Forson
	H.P. & M.A.	Spad	F-CMAV	Paris	London	13.45	16.05	Gds&M.	1	Bourdon
	A.T. & T.	DH9	G-EAQN	Amsterdam	London	15.35	19.15	Mail	2	Carter
	A.T. & T.	DH9	G-EAGY	Paris	London	16.50	19.30	Nil	2	Bamber
August 6th	A.T. & T.	DH9	G-EAOZ	London	Paris	09.40	11.15	Gds&M.	1	Lines
	A.T. & T.	DH9	G-EAQN	London	Amsterdam	10.15	12.32	Goods	Nil	Robbins
	A.T. & T.	DH9	G-EAGY	London	St. Inglevert	12.33	13.15	Nil	2	Bradley
	A.T. & T.	DH16	G-EAPT	London	Paris	16.45	18.50	Mail	3	Holmes
	A.T. & T.	DH18	G-EARI	London	Paris	16.55	18.55	Goods	5	Armstrong
	H.P. & M.A.	Spad	F-CMAV	London	Paris	17.25	19.30	Nil	Nil	Bourdon
	C.T.	Nieuport	F-CGTI	London	Paris	17.42	20.00	Nil	Nil	Petit
	A.T. & T.	DH16	G-EAPT	Paris	London	09.45	12.15	Nil	3	Armstrong

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No. of Passengers.	Pilot
August 6th	A.T. & T.	DH16	G-EAPM	Paris	London	11.35	14.20	Goods	Nil	Game
	C.T.	Nieuport	F-CGTI	Paris	London	12.32	16.20	Mail	Nil	Petit
	I.A.L.	"Vimy"	G-EASI	Paris	London	13.05	16.35	Goods	3	Barnard
	A.T. & T.	DH16	G-EALM	Amsterdam	London	15.40	19.20	Mail	Nil	Reeve
	A.T. & T.	DH9	G-EAPL	Paris	London	16.30	19.25	Nil	2	Milnes
	A.T. & T.	DH9	G-EAOZ	Paris	London	17 05	20.00	Goods	Nil	Lines
August 7th	A.T. & T.	DH16	G-EALM	London	Paris	09.37	11.35	Gds&M.	3	Game
	A.T & T.	DH9	G-EAOZ	London	Paris	09.42	11.50	Goods	1	Carter
	A.T. & T.	DH9	G EAPL	London	Amsterdam	11.07	13.53	Goods	1	Milnes
	A.T. & T.	DH18	G-EARI	Paris	London	09.55	12.30	Nil	6	Armstrong
	A.T. & T.	DH16	G-EAPT	Paris	London	12.10	14.35	Goods	Nil	Forson
	H.P. & M.A.	Breguet	F-CMAC	Paris	London	13.45	15.53	Goods	2	Le Men
	A.T. & T.	DH9	G-EAGY	St. Inglevert	London	15.00	16 20	Nil	1	Bradley
	A.T. & T.	DH9	G-EAQN	Amsterdam	London	15.18	18.00	Nil	1	Robbins
	A.T. & T.	DH9	G-EAOZ	Paris	London	16 40	19.39	Nil	1	Carter
August 8th	A.T. & T.	DH18	G-EARI	London	Paris	10.40	Landed Berck	Gds&M.	5	Armstrong
	A.T. & T.	DH9	G-EAQN	London	Berck	19.00	—	Nil	1	Forson
	A.T. & T.	DH16	G-EALM	Paris	London	10.15	12.15	Nil	4	Holmes

The Air Port of Cricklewood.

(Compiled from Air Ministry Communiqués.)

August 2nd	H.P. & M.A.	Hand'y Page	G-EATE	Brussels	London	10.45	14.10	Nil	Nil
	H.P. & M.A.	Hand'y Page	G-EATK	Paris	London	13 45	16.10	Goods	2
	H.P. & M.A.	Hand'y Page	G-EASY	London	Paris	12.30	16.15	Nil	3
	H.P. & M.A.	Hand'y Page	G-EATH	Brussels	London	15.10	19.25	Nil	4
August 3rd	H.P. & M.A.	DH9	G-EAUQ	Paris	London	10.15	16.00	Nil	2
	H.P. & M.A.	Hand'y Page	G-EATG	London	Paris	12.00	15.05	Goods	4
	H.P. & M.A.	DH9	G-EAUI	London	Brussels	15.00	17.10	Mail	1
	H.P. & M.A.	Hand'y Page	G-EATN	London	Paris	17.35	20.30	Nil	1
	H.P. & M.A.	Hand'y Page	G-EAUH	London	Amsterdam	16 00	19 30	Mail	Nil
August 4th	H.P. & M.A.	Hand'y Page	G-EATM	London	Paris	12 05	15 30	Goods	8
	H.P. & M.A.	Hand'y Page	G-EATN	Paris	London	12.30	15 55	Nil	9
	H.P. & M.A.	Hand'y Page	G-EASM	Paris	London	12.35	15 55	Nil	4
	H.P. & M.A.	DH9	G-EAUI	Brussels	London	15.00	17.50	Mail	Nil
	H.P. & M.A.	Hand'y Page	G-EASZ	London	Brussels	14 45	18.00	Gds&M.	1
	H.P. & M.A.	DH9	G-EAUH	Amsterdam	London	12.00	14.45	Nil	Nil
	H.P. & M.A.	Hand'y Page	G-EATM	Paris	London	17.30	20.30	Goods	Nil
August 5th	H.P. & M.A.	Hand'y Page	G-EATK	London	Paris	12.10	15.35	Nil	5
	H.P. & M.A.	DH9	G-EAUH	Amsterdam	London	12.10	14.50	Mail	2
	A.T. & T.	DH9	G-EAQP	Amsterdam	London	12.22	15.10	Nil	2
	H.P. & M.A.	DH9	G-EAUC	Amsterdam	London	14.44	19.40	Nil	2
	H.P. & M.A.	Hand'y Page	G-EASZ	Brussels	London	15.30	21.20	Mail	3
	H.P. & M.A.	DH9	G-EATA	Brussels	London	13 45	17.00	Nil	Nil
August 6th	H.P. & M.A.	Hand'y Page	G-EATN	London	Paris	12.07	15.00	Goods	2
	H.P. & M.A.	Hand'y Page	G-EATK	Paris	London	12.55	17.10	Nil	4
	H.P. & M.A.	Hand'y Page	G-EATJ	London	Brussels	14.40	16.50	Mail	4
August 7th	H.P. & M.A.	DH9	G-EATA	Brussels	London	10.00	12.55	Nil	Nil
	H.P. & M.A.	Hand'y Page	G-EASN	London	Paris	12.15	15.15	Goods	6
	H.P. & M.A.	Hand'y Page	G-EATM	London	Paris	12.00	15.00	Nil	9
	H.P. & M.A.	Hand'y Page	G-EATN	Paris	London	12.40	16.05	Goods	1
	H.P. & M.A.	DH9	G-EAUQ	London	Brussels	14.50	17.05	Mail	Nil
	H.P. & M.A.	Hand'y Page	G-EATJ	Brussels	London	15.30	18.40	Gds&M.	2
	H.P. & M.A.	DH9	G-EAUO	London	Amsterdam	16.56	18.30	Mail	Nil
August 8th	H.P. & M.A.	Hand'y Page	G-EATH	London	Paris	12.15	15.40	Goods	5
	H.P. & M.A.	Hand'y Page	G-EASM	Paris	London	12.50	16 00	Nil	6

ABBREVIATIONS—A.T. & T.—Air Transport & Travel, Ltd.; H.P. & M.A.—Handley Page and Messageries Aeriennes. I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company, M.W.T.C.—Marconi Wireless Telegraph Company. Where times are missing it is probably owing to Atmospherics affecting signals.

Inland Flying at Croydon.

Aug. 2nd—A.T.T., 1 D.H.18, 3 tests

Aug. 3rd—A.T.T., 1 D.H.18, 4 tests; 1 D.H.16, 2 joy-rides.

Aug. 4th—M.W.T. Co., D.H.6, tests. I.A.L., Vimy, 2 tests.

Aug. 5th—A.T.T., D.H.16, 3 tests. M.W.T. Co., D.H.6, wireless tests. Bristol Aeroplane Co., 1 Mono to Martlesham.

Aug. 6th—A.T.T., D.H.9, test. M.W.T. Co., D.H.6, tests.

Aug. 7th—I.A.L., Vickers Vimy, photography.

Aug. 8th—A.T.T., D.H.9, Bournemouth return; D.H.16, 1 joy-ride.

The London Terminal Aerodrome.

Pits are now being dug on the aerodrome at Croydon, so pilots who have not already acquired that habit should look before they land. One at first thought these pits were some form of "Goliath" trap, but investigation proved them to be the start of the installation of the landing lights. These should be in working order inside three months.

A somewhat amusing incident occurred during the week. Some well-known French actresses, including Mistinguette, were starting for Paris in the "Goliath." The machine started with its tail against the A.D.C. buildings and opened up towards the level crossing. When about twenty feet in the air, the pilot found that the starboard engine was not giving its revs., so he switched off and landed just short of the level crossing. As the machine was coming to a standstill, the trail of perfume which was wafted across from the machine was intermingled with sounds such as emanated from the old waterchute at the Crystal Palace on Bank Holiday.

However, after a few minutes the machine restarted, followed by Mr. Uwins on a Bristol monoplane, the take-off of this little machine making an amusing contrast to the "Goliath."

There is now a large notice-board with "London Terminal Aerodrome. To Continental arrival and departure station" on it, at the point where Plough Lane joins the tram lines. This seems to convince passers-by of the existence of the air line far more than did the actual aerodrome and machines.—G. D.

The Instone Air Line.

The "Vimy" has been on the Paris service during the week as usual. It has also been making trips over London, carrying *Evening News* photographers who have been taking photographs for the series now appearing in that news-sheet. Some of those published are similar to, and nearly as good as, those which have been reproduced from time to time in The Aeroplane during the last nine years.

The wireless apparatus is now fitted and, except during such incidents as reported in another part of the paper, is giving every satisfaction.—G. D.

A Royal Visit to S. E. Saunders, Ltd.

Their Majesties the King and Queen, the Duke of York, K.G., the Princess Mary, and the Ladies and Gentlemen in attendance, visited on Aug. 7th the yard of S. E. Saunders, Ltd., of East Cowes. They were received by Mr. Samuel Saunders and Mr. H. S. Saunders, his son, and were conducted through the works.

They were shown the Kittiwake, an amphibian entered for the Government competition beginning at Felixstowe on Sept. 1st. The hull and planes are constructed of three-ply wood sewn on the "Consuta" system. There are no external bracing wires and no fabric is used. Their Majesties also inspected two Vickers-Saunders "Valencia" flying-boats under construction for the Air Ministry. The armament of these aircraft is in each case a q.f. gun.

Bournemouth.

Mr. R. O. Lindsay, recently a pupil at the Bournemouth Aerodrome, went for his Aero Club certificate on Aug. 6th, and, instead of returning after the statutory one hour's flying, did not return for two hours, by which time (21.45) it was almost dark, with the result that he crashed and broke a leg in landing just outside the aerodrome. It was reported on some unspecified authority that in the course of his two hours' flying he had reached an altitude of 18,000 ft. on a standard Avro. If by any chance this claim should be substantiated it must be pretty nearly the record altitude for the type of machine, but one would like to see evidence and corrected figures before vouching for the accuracy of the claim.

Mr. Lindsay is to be congratulated on having received excellent value for his tuition fees in that, instead of the statutory hour's flying, he managed to get in two hours, reached what was evidently quite a considerable altitude for a pupil, and ended with quite a wholesale smash, but without much damage to himself. Unfortunately he will have to do it all over again, minus the smash, as the Aero Club rules unsympathetically insist that in descending from a certificate flight the aviator must land himself and his machine intact and not "reduced to produce."

Mansfield.

Mr. H. Sykes, who was formerly with the Central Aircraft Company, and is now running a passenger-flight business of his own with an Avro, has been flying for some time at Mansfield. Since he has been working on his own account he has taken up close on 1,000 passengers and has not had the slightest trouble either with his Avro or with his Le Rhône engine. His only complaint is that out of the 21 weeks since he left London it has rained fairly consistently for 15 weeks. He ascribes this to the fact that he christened the machine "Psyche," and apparently the clerk of the weather has determined that Psyche shall have her bath fairly regularly.

Scarborough.

The Border Aviation Company is doing extremely well at Scarborough this holiday season. A three-seater Avro in excellent condition was bought a week or so ago from the West of Scotland Aviation Company and was flown from Glasgow to Scarborough by Capt. John Oliver. In four and a half days after her arrival the machine took up 200 passengers.

The firm's original Avro is being overhauled and will shortly be able to add to the firm's takings. In addition Mr. Ingham, one of the directors, has purchased a B.E.2e to be used for cross-country flights. This is an excellent idea in that the B.E. type is economical to run, has a very reliable engine, and is a safe machine for emergency landings.

Mr. Kenworthy, who is well known as the pilot of Blackburn "Kangaroos," went over to Scarborough for the Bank Holiday week-end on a machine of his own and had the misfortune to choke his engine, with the result that the machine was somewhat severely deteriorated. It is interesting to note that the holiday-makers at Scarborough after investigating the wreck of his machine still went and booked joy-rides, apparently on the theory that when there has been a crash in a particular neighbourhood the law of averages makes it fairly certain that there will not be another immediately.

THE BRITISH DOMINIONS BEYOND THE SEAS.

SOUTH AFRICA.

Civil Aviation.

A correspondent in South Africa writes that a short Bill is likely to be introduced into the South African Parliament very shortly in order to safeguard the interests of aviation in South Africa. Such a Bill is undoubtedly necessary for the protection of sound aviation enterprises and of the public.

There are in South Africa a number of men who have aeroplanes and are taking up passengers, but there is no control over them and consequently there is no guarantee either that the pilots are competent or that their machines are fit to fly. Consequently, they are quite at liberty to kill passengers either through stunting on unreliable machines or through flying recklessly at a low level over large towns.

Aviation, Ltd.

Among the sound concerns in South Africa are Aviation, Ltd., run by the two Solomon Brothers. They own two D.H.6s. and are said to have done remarkably well. They have flown over most of the Southern areas of South Africa, have carried hundreds of passengers, and it is said that they have made money. S.A.A.T., Ltd., which is run by Colonel Armes and Majors Miller and Young, are said to have had rather a bad time some months ago and it was feared that the firm would be unable to survive until the development work done by the proprietors began to secure business. However, the firm has won past the worst period and it is understood that it is now doing very well and making money.

Handley Page South African Transport, Ltd.

Handley Page South African Transport, Ltd., of which Captain Meintjes is the manager, were unfortunate in their first attempt to reach Johannesburg early this year. Since then, however, they have done a great deal of useful work and, what is better still, they have learnt a great deal about the conditions prevailing in South Africa. Not long ago the South African College Rugby Fifteen travelled inland on a Handley Page machine, won their match and flew back to Capetown. A large number of South African notabilities, including about sixty Members of Parliament (including Nationalists) and a number of their womenfolk, have been given their baptism of the air by the Handley Page Company.

A Combination of Interests.

It is rumoured that a combination of South African aviation interests which will have the strong support of the Government is likely to take place soon. Moreover, it is said that prominent South African financiers are interested in the proposed deal, so that it will have the support of local patriotism and thus be practically assured of success.

The Aero Club of South Africa.

The Aero Club of South Africa is now the only aeronautical body in the Union. The present membership is over 300. No practical flying has yet been carried out by members, although the Club has given assistance to those engaged in commercial aviation. Lectures and social engagements occupy the Club for the moment. It is, however, hoped that Government surplus machines may be purchased in order that pilot members of the Club may keep in practice.

Flying in the Union.

There are at present no aerial regulations, and those concerned in the organisation of aerial routes are fearful of possible fatal accidents due to negligence or non-airworthy machines. There has recently been a lull in flying, as the winter months are not entirely favourable nor has the Government shown any signs of real interest. Hence it has not been possible to open regular air routes.

Apparently the heat and the "bumpiness" common in South African flying are due to ground radiations. Strong winds are usually in existence above the hot belt. Consequently it is probable that commercial flights will of necessity be made at altitudes of 10,000 ft. and above.

Ground transport routes for aeroplane parts are very high. A wing was sent up country a distance of 470 miles recently at a cost for carriage alone of £52.

FOREIGN INTELLIGENCE.

ARGENTINA.

The Argentine correspondent of THE AEROPLANE writes :—

Flights over Buenos Aires.

The Minister of War has communicated with the Minister of the Interior suggesting that flights over the city of Buenos Aires at a height of less than 1,500 m. should be forbidden, as the practice may lead to very serious fatalities. A British officer recently explained that the practice pursued here is exceedingly dangerous to the public. A pilot coming down in a thoroughfare or plaza would have a good chance to escape, but would be almost certain to create most appalling havoc among the packed masses of the people in the streets.—DUMSPIRAL.

BELGIUM.

The Antwerp Meeting.

On July 28th, M. Sadi-Lecointe on a Nieuport won the speed race. Over a 1 km. course out and home his speed was 235 k.p.h. (146 m.p.h.). M. Poupon was second on a Spad. In a competition for forced landings at a given point, a type of machine reported in *L'Auto* as an H.D.4 won 1st, 2nd and 3rd places both for single- and two-seaters. In the "concourse of unsticking," according to the same paper, Captain Cockerell

was first on a Vickers "Vimy" and Flight Lieut. Scott was second on a "Plane Handley Page." As explained last week these machines were the "Viking" and "F.3" boats respectively. In the daily placings Flight Lieut. Scott was first with 35.5, and Captain Cockerell second with 23.75, points.

In Class 2, for "gros porteurs," France is represented by Duhamel on a Latham (three 220 Panhard-Levasseur), and England by the "F.3" boat. In Class 3 there is a five-engined Caudron, the "Viking," and a Savoia. In the hydroglisseur competition the Comte de Lambert, who was the first pilot to fly over Paris, is piloting a boat of his own design.

On July 29th, Captain Cockerell and Flight Lieut. Scott departed.

DENMARK.

The Danish correspondent of THE AEROPLANE writes :—

The sudden appearance some time ago of Mr. McMullin with two passengers in a Lepaerial chartered D.H.9, not having been announced in the required way, has worried many who desired to fly to Denmark both during and after the Danish seamen's strike.

So it may be worth while to put on record that as long as "Anordning om Luftfart" (Regulation for Air Navigation) is not in force every foreign aircraft has in each single case to acquire permission for crossing over or landing on Danish ground from Ministeriet for offentlige Arbejder, Copenhagen (the Office of Public Works). The military aerodrome at Christianshavn and the naval air station at the Royal Dockyard, both Copenhagen, are open to public traffic. Request for landing permit has to be sent to Krigsministeriet (War Office) or Marineministeriet (Admiralty) respectively, both Slotsholmsgade, Copenhagen. Further, an insurance covering 60,000 Kr. third-party damage is required.

FRANCE.

The French Government Competition.

The French Government competition for aeroplanes, organised and controlled by the Service Technique de l'Aèronautique, is to be held early in 1921. All aeroplanes entered for the contest must be at Villacoublay by Dec. 31st next. The competition for aero engines begins on Aug. 15th next. Both these contests were originally arranged by General de Brigade Duval when he was Director-General of Military Aeronautics

The following machines have been entered for the aeroplane competition :—(i) Blériot triplane "Mammoth," four Hispano-Suiza engines, weight fully loaded 7,000 kilos.; (ii) Latécoère biplane, three engines (one 500-h.p. Salmson and two 200-h.p. Salmsons), weight fully loaded 6,500 kilos.; (iii) Farman biplane "Goliath," modified, three 200-h.p. Salmsons, weight fully loaded 5,281 kilos.; (iv) Caudron "C.25" biplane, three 200-h.p. Salmsons, weight fully loaded 5,320 kilos. All these machines are, or will be, ready in time for the contest. A fifth machine, the Breguet with four Bugatti engines totalling 810 h.p., may not be ready in time. The weight fully loaded will be 6,320 kilos.

After elimination examinations the aeroplanes entered will fly over a course of which the following are the stages which must be covered without intermediate descents and at any speed and height :—Villacoublay-Lyon-Tours-Metz-Chateauroux-Saint Inglevert-Dijon-Istres-Bordeaux-Villacoublay. The total distance to be covered is 4,500 kilometres (2,794 miles). The days on which the flights are made may be chosen by the entrants.

The following entries have been received in the engine competition :—(i) Renault, a 350-h.p. engine derived from the 450-h.p. Renault and fitted with reduction gear; (ii) Schneider, a 350-h.p. engine derived from the 370-h.p. Lorraine; (iii) Farman, three types of engines fitted to the Goliath; (iv) Breguet, a modified Bugatti; and (v) Salmson, a 300-h.p. engine.

The credits for these trials were included in the Extraordinary Budget of 1920.

The Paris-Cabourg Aerial Service.

The annual aerial service run by the Compagnie des Messageries Aèriennes between Paris and Cabourg during the Deauville season is running this year from July 15th until Aug. 30th.

GERMANY.

The Danish correspondent of THE AEROPLANE writes :—

The Halberstadt Aerodrome.

In heavy competition with other cities, the Halberstadt aerodrome has been chosen as the station of the Saxonian safety police flight squadron, as to this end the total works of the erstwhile Halberstadt Aircraft Manufacturing Co. has been bought from the Berlin-Halberstadt Industrial Works.

Sporting Fixtures and Aerial Mails.

To revive national flying, sport meetings were planned during July at the two seaside resorts, Warnemünde and Heringsdorf, according to *Illustrierte Flug-Welt*.

On July 4th the daily air mail was resumed between Berlin and Swinemünde (1½ hr.) and Hamburg-Westerland (2 hr.). The extra fee is for post-cards and letters below 20 g. weight 20 pf., letters between 20 and 50 g. and printed matter to 50 g., 80 pf.; 50-100 g., 1.60 mark; 100-250 g., 2.40 mark; 250-500 g., 4.80 mark; 0.5-1 kg., including parcels, 9.60 mark; urgent parcels, not exceeding 60 cm., 10 mark for every kg. or part of a kg. The post offices accept subscriptions for aerial delivery of newspapers.—H1.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

The Ricci Triplane.

The Ricci Bros. inform me that the "littlest triplane in the world" has been picked up by a group of sportsmen at Monza. I write metaphorically, of course, though there seems no reason why members of the group individually may not have picked up the machine in the material sense of the phrase.

The Macchi Aeroplanes.

Messrs. Macchi's M.16, the winner in the 6-metre Taliedo tests, had a Feroldi carburetter on its 6-Y Anzani engine, to which, by the by, M.C. inlet valves had been fitted (which accounts for the height record probably), and which, with aluminium pistons and redesigned lubrication system, have clearly made a most reliable little engine of it. Ing. Tonini, of the Macchi firm, is said to be going to obtain even better results with a two-seater of much the same power. This, no doubt, after the Schneider Cup boat is off their hands. They kindly promise me early details of this machine, which will be powered by the new I.F. 320-h.p., type V9, recently illustrated by THE AEROPLANE.

The Savoia is to use the big Ansaldo engine.

The Mapelli Cup.

To demonstrate the practical side of these small vehicles an annual and international speed across-country race, called the Mapelli Cup, is to be carried out on the first Sunday of August, beginning this year. The trip is for this occasion only 190 km., and machines have to come down and stop their airscrews for five minutes at six flying-grounds, starting from and returning to Taliedo.—T. S. H.

JAPAN.

The correspondent of THE AEROPLANE in Japan writes on July 20th :—

The Curtiss Company.

Mr. T. E. Stevenot, the Eastern Representation of the Curtiss Aeroplane and Motor Corps. of America, come to our country for the purpose of establishment of the large flying works. The works will be constructed in combination with our capitalists and take charge of the traffic of the air in the East.

Nagoya.

Nagoya has a future as the centre of the industry of the aerial world in Japan. The place is situated near the Kagamigahara army aerodrome, and the aerial station of Navy now under reconstruction, and at Ordnance Manufacturing Department Nagoya Branch has military flying machines are being made, and at Nippon-Sharyo-Seizo-Kaisha also making military flying machines. The famous Mitsubishi Dockyard has selected the place as the site of their flying machine works which is now in the course of establishment and the main works of the Curtiss Corporation is said to be founded here.

The Le Rhone Engine in Japan.

The Tokio Gas and Electric Engineering Co., Ltd., has been obtain the licence of manufacturing Le Rhône motor from France some time ago, and said will begin business from this year, and will produce 300 Le Rhône motors in a year.

An Englishman's Flight.

Mr. Frank Shaw Kilby, an Englishman aviator and member of the Sale and Frazar, Ltd. (agent of Handley Page, Ltd.), was succeeded his first flight in Japan on July 5th. He flown between Tokio and Yokohama.

The Tragedy of the Geisha who Flew.

The well-known Japanese civilian aviator, Mr. T. K. Oguri, suffered slight injuries in a fall June 13th afternoon when his flying companion, a geisha girl named Rokusuke, accidentally interfered with the controlling apparatus of the machine. The aviator and his companion fell into a creek from a high of 35 metres. The injuries incurred by the geisha girl are said to be such as to require treatment for about a month.—N. K.

JAVA.

Aviation in Java.

A correspondent in Java writes :—

The principal aerodrome is Kali Dvatch, which was originally part of the Pamanoekan en Tjiassemlanden, the Dutch holding company, all of whose shares are owned by the Anglo-Dutch. A well-known aviator in England, De Ruyter, is here. Avros with 110 Le Rhone engines and D.H.9s with 230-B.H.P. engines are the machines at present in use; but S.E.5s. are on the way. All flying takes place before 9 a.m. Too bumpy and not enough lift owing to heat after that.

The aerodrome is about twice as big as Northolt and quite flat, a very good one. At present the hangars are native attap-roofed huts, but permanent concrete ones are being made.

When 'planes first came here the Dutch officers were very slow at joining the Air Force, so the G.O.C. went for a flip

as a fillip to recruiting. Unfortunately, they left it a little late and crashed; the General was killed and the pilot severely injured. However, they now have sufficient aspirants. Of course, the Dutch draw no colour line, and tons of half-castes are officers in their army here. When Ross-Smith was here he approached Java about the extreme north-west point of the island, and the natives working on the estates in the neighbourhood fled and did not return in some cases for weeks. One seaplane is now at Tandjong Priok, the harbour of Batavia, but the make, etc., is unknown to me so far.

H. R. G. W.

RUSSIA.

The Danish correspondent of THE AEROPLANE writes :—

Some Russian Figures.

"Flugsport" of May 12th publishes the following news of the Russian aircraft industry. Prior to the war Russia possessed only four aeroplane manufacturing works, and thus three in St. Petersburg and one in Moscow. [What about the branch of the Riga Waggon Works, building Sikorsky ordinary and giant biplanes?—Ed.] Further, two factories in Riga and Moscow were engaged on the production of aero-engines. Altogether these works employed 2,000 men. In 1915 two new aircraft factories were formed, and in 1916 and 1917 two further ones. Beside which many small enterprises were started during the war. The output developed at a giant pace. In 1914 329 aeroplanes were completed altogether, in 1917 the figure had tripled to 963. The value of the aircraft amounted in 1914 to about four million, in 1917 to 50 million roubles. The workmanship in the aircraft factories was fairly poor, as the work was hurried through with fairly low accuracy. The latter amounted in 1916 and 1917 to about 40 per cent. of the produced machines. The new-formed factories were for the greater part branches of foreign enterprises. The Moscow department of the French works was destroyed by fire in 1918.

As both the German Aero Club and the Aeronautical Society in Berlin have recently had papers read by refugees from Russia, the latter are likely the sources for the above information.

SWITZERLAND.

A correspondent in Switzerland writes :—

The Youngest Swiss Pilot.

The youngest Swiss pilot, M. Pierre Wisard, took his brevet at La Blécherette aerodrome, Lausanne, on Saturday, July 31st. Flying the 130 Clerget Avro, belonging to l'Ecole Aero, he put up the best show ever seen in brevet tests here, and aroused some admiration, as the Lausannois always like to watch the graceful manœuvres of the Avro. M. Wisard is the second pupil to pass out under Mr. Bradley since April, so business is evidently slow.

There are indications that the Federal Military Authorities, who at the aviation centre at Dubendorf are still producing "flat turn merchants" by obsolete methods on unsuitable machines, are taking a little more interest in the Avro at last.

The Office Aerien Restrictions.

Controversy is once more rife as a result of the Office Aérien's latest communiqué, which restricts stunt flying so effectually as practically to choke it out of Swiss flying altogether, except at Dubendorf. Amongst other things, only specially qualified pilots may "stunt," such pilots must always obtain authorisation for each show; in the case of public exhibition flights this permit will cost 200 f. (£9) per exhibition payable to l'Office Aérien; machines must be furnished with a parachute, and no machine used for stunting may be used for public transport or joy-riding.

As l'Ecole Aéro is half-way through a "stunt course" with M. Wisard, and also desires to carry passengers in the Avro, the school has intimated to Bern that this wholesale "verboten" must cease forthwith. Further fireworks are expected.

The whole show is the result of Taddeoli's Savoia breaking in the air the other day at Romanshorn during a "stunt" show. Considering the design of his Savoia was for lightness and minimum resistance with a view to speed, I always thought Taddeoli's evolutions were a little brusque.

The Work of l'Ecole Aero.

L'Ecole Aéro is running meetings in August at Montana, Echallens and Thierrens; the Montana ground is 4,000 ft. above sea level. The school has three two-seaters in use. Besides the Avro there are two buses entirely designed and built at Lausanne by the chief mechanic, M. Wullschleger. One, the Aéro 22, Fiat 100 h.p., is dual-control, but too heavy to be pleasant. The other, Aéro 21, is a light one-bay biplane, 80 Le Rhône, "X" form interplane struts, which gets off and lands like a lift, requiring only about 25 yards room.

The Swiss Air Transport Combine.

The Swiss Air Transport Combine, Ad-Astra-Aero-Avion-Tourisme, after a somewhat grandiose and windy flotation and some months of idleness, is at last getting to work at 25 f. and 35 f. per 15 min., according to number of seats filled. As was expected, they find plenty of custom, as the lake-side promenades are always crowded with the class of people who can afford to pay. During June, 611 passengers were carried at the company's four lake stations, Geneva, Zurich, Romanshorn and Lugano, and July figures will be better still.

The Aerodrome at La Blecherette.

British pilots flying to Italy should note that the aerodrome at La Blécherette, two miles north of Lausanne (altitude 2,000 ft.), is now clear of obstacles, such as telephone wires, and trees. It is 600 m. long by 300 m. (length is N. and S. with the prevalent winds), and being situated on a slight crest, with free entry all round, is big enough for anything. There is a slight slope down from N. to S.

The hangar is 15 ft. high (doors) by 175 ft. by 75 ft., and the roof carries two large white circles, easily visible from 10,000 ft. No charge is made for the first landing. Complete machines are designed and built in the workshops, so that repairs of all kinds can be carried out. The Customs and police offices are now built, and the university meteorological station is fixing up wireless for communication with Dijon, Paris, and Italy.

A Visit by Maneyrol.

The last foreign visitor was M. Maneyrol, returning from his Paris-Rome-Paris raid on July 4th. Unable to find a passage across the rain on the Jura he took refuge at Lausanne just before a heavy storm arrived. He had had some thrilling times at 17,000 ft. in dense cloud over the Mont Cenis-Mont Blanc region, and fortunately "came through" the bottom ceiling at 2,000 ft. in the Rhone valley south of Geneva.

B. E. S.

Aerobatics in Switzerland.

L'Office Aérien issued the following instructions on the subject of "stunt" flying in Switzerland.

1. No acrobatic performance is allowed without special authority.

2. This exceptional authority is granted only (a) to pilots who possess an efficiency certificate (*L'Office Aérien* reserves the right to compel applicants to instal on their machines a stress indicator); (b) to pilots whose machines possess an airworthy certificate in which the ability to "stunt" is set down, and inasmuch as the responsibility between third parties is fixed and guaranteed.

3. Organisers who wish to include aerobatics on their programme should in each case make an application to *L'Office Aérien Fédéral*. This application must be accompanied by all the documents mentioned in paragraph 2, and a recommendation of authority from the local police and the programme. These authorisations are subject to a tax of 200 f.

4. Authorised flights are subject to the following rules :—(a) the occupants of the aeroplane must be provided with a parachute of a type sanctioned by *L'Office Aérien;* (b) the load must not be in excess of that specified for "stunting" in the airworthiness certificate; (c) all "stunting" below 500 metres is strictly forbidden; (d) pilots must not perform over populated or built-over districts, whether land or water; (e) during a meeting the enclosure over which "stunting" is to take place will be closed to spectators.

5. Aeroplanes used for aerobatics must not be used for passenger work on ordinary air lines.

UNITED STATES OF AMERICA.

The Witteman-Lewis Aircraft Company, Inc.

This company, with headquarters at Hasbrouck Heights, New Jersey, has been in existence for some years and has supplied many machines to the U.S. Government. Recently it has purchased 800 acres of land in New Jersey, seven miles from Manhattan, New York. On this ground an aerodrome is being laid out and a factory equipped with the most modern woodworking and metal machinery, a metallurgical laboratory, wind tunnel, meteorological station and wireless plant. On the east of the aerodrome is the Hackensack River.

The company intends to let sheds to other firms in the aircraft industry and to organise meetings similar to those held at Hendon in the days of Richard Gates. The aerodrome is to be the Eastern Aerial Mail Terminal of the U.S. Postal Department, which will in consequence abandon its present ground at Heller Field, Newark, N.J. The chief engineer is Mr. Arcier, late of Hendon, London, Eng.

The Racehorse and the Aeroplane.

According to the Argentine news sheets an owner of racehorses has had one of his fleetest and most charming of horses conveyed by aeroplane from Los Angeles, California, to S. Barbara, California, where it was entered in a race. It arrived in perfect condition if the chronicler of the story is to be believed. Perhaps it will be possible in a few seasons to box one's hunters to the meet by aeroplane, a habit which will, no doubt, give pleasure to world-weary M.F.H.s.

AN AIRCRAFT INSURANCE BROKER AT LLOYD'S.

Mr. J. M. Pearson, who until recently was on the staff of the Controller of Civil Aviation, has now started business as an insurance broker at Lloyd's and will pay special attention to aircraft. He has an office at 48, Suffolk House, Laurence Pountney Hill, Cannon Street, London, E.C.4.

RECORDS.

Those readers of THE AEROPLANE who subscribe to the comic papers will of course be familiar with the rollicking humour of our American contemporary, the *Aerial Age*, and, with the writer, will no doubt have noticed the truly extraordinary modesty evinced in its columns. In particular is it shy of claiming records, carefully weighing the evidence and delicately shrinking from making any claim that cannot be fully substantiated by facts. The *Aerial Age*, however, is quite safe in stating that the United States holds more aviation records than any other country. Many of these records are quite unique, as may be seen from the following items forecasted for a future issue of the *Aerial Age* :—

Flyer's Record Death Swoop.—Samuel S. Strut, the famous American Ace who chased a German single-seater over the line on Nov. 12th, 1918, whilst flying a Strut "Man-killer" biplane at Spearmint Flying Field the other day dived into the ground with engine full on from a height of 16,000 ft. and was immediately killed. This is confidently claimed to be the world's record crash, and our readers will join with us in cordially congratulating the patriotic flyer's parents on his phenomenal achievement.

Airplane Aids Ball Team.—On the occasion of the great ball game between the Oklohama Orangesox and the Denver Dwarfs, Eddie Chuck, the Dwarfs' pitcher, ran out of gum at a critical moment of the game. As the town's supply was exhausted by the enormous crowd of fans who witnessed the contest, a cable was dispatched to the Wrigley Gum Corporation Inc., who immediately obtained one of the gigantic Lawson Air Transport Ships to transport a packet of gum to Denver, where it arrived safely within an hour after the end of the game. This is claimed to be the first time in the world that gum has been shipped by airplane. Below we illustrate a bar of the gum chewed by Eddie and the Sales Manager of the Wrigley Corporation, whose enterprise resulted in establishing yet another world's record for America.

Aerial Jazz.—A novel stunt was featured last week at the Spangled Banner Aeronautic Exposition. A Junkers-Fokker all-metal monoplane (all American manufacture, of course) cruised at 1,000 ft. above the Exposition, carrying a Jamaican Jazz Band, to the inspiring strains from which the two dare-devil American aerobats, Orwin Orenco and Earle D. Tailspin, danced a jazz on the plane of another Junkers-Fokker. This is a world's record for imbecility.

And so on *ad nauseam*. "PENGUIN."

AN ANNUAL OUTING.

The annual outing of the employees of Thos. Firth and Sons, Ltd., the well-known Sheffield steel manufacturers, took place during the August Bank Holiday week.

The firm have always taken the keenest interest in the welfare of their workpeople, and have for many years assisted them to spend a day either at the seaside or in the country. On the occasion of this year's outing a democratic vote was taken, and it was decided to travel to Matlock by road.

Over a thousand people were carried, necessitating a fleet of more than forty large char-a-bancs—so large a number that the police ordered it to proceed to Matlock in two sections and by different routes.

A thoroughly successful and enjoyable day was spent, typical of the excellent relations which have always prevailed between the firm and its employees.

AIRCRAFT IN PARLIAMENT

HOUSE OF COMMONS

The following written answer was given on Aug. 2nd :—

BRITISH AND AMERICAN AIRCRAFT PATENTS (WAR CLAIMS).

Lieut.-Commander YOUNG asked the Prime Minister whether His Majesty's Government has agreed to indemnify the Government of the United States against claims by British subjects against that Government in respect of the use by that Government during the War of British patents and other proprietary rights relating to aircraft; whether any reciprocal liability has been undertaken by the Government of the United States towards the British Government; and what is the estimated or ascertained measure of the financial liability of the British Government under this indemnity.

The PRIME MINISTER: The British Government has accepted certain responsibilities and the American Government has given certain undertakings. The extent of the liability to be accepted by both Governments still forms the subject of consideration. The financial aspect of the matter cannot at present be gauged, inasmuch as the responsibility of the respective Governments has not been clearly defined and the claims to be dealt with thereunder have not yet been investigated.

* * *

Aug. 6th.—The following oral answer was given :—

ROYAL AIR FORCE.—BRISTOL AEROPLANE COMPANY.

Mr. RENDALL asked the Secretary of State for Air whether he is aware that men who left their work in 1914 and 1915 and went to the Bristol Aeroplane Company to work are still retained there including woodworkers, carpenters, joiners, masons, etc., who badly wanted for providing houses in and around Bristol; and whether women who left situations in shops and domestic service, and went to this firm in 1916, are also retained there whilst over 5,000 ex-soldiers are out of work in Bristol.

Mr. CHURCHILL: The Bristol Aeroplane Company is a private concern, and the Air Ministry has no control over the numbers and types of workpeople the firm may see fit to employ. In so far, however, as skilled men are being employed in carrying out Air Ministry contracts, I can assure my hon. friend that the work which they are doing is necessary for the Royal Air Force.

Mr. RENDALL asked the Secretary of State for Air what contracts the Bristol Aeroplane Company, formerly the British and Colonial Aeroplane Company, have for the Government; and whether the Government are financing the above firm or giving them any form of subsidy.

Mr. CHURCHILL: I am sending my hon friend a list of the Air Ministry contracts on which the Bristol Aeroplane Company are engaged. The company is not financed or given any form of subsidy by the Government.

* * *

AIR EXPENDITURE.

Navy, Army, and Air Expenditure, 1918-19, was considered in Committee on Aug. 3rd :—

"III. Whereas it appears by the Air Appropriation Account for the year ended the 31st day of March, 1919, and the statement appended thereto, as follows, namely :—

(a) That the aggregate expenditure on Air Services exceeded the aggregate sums appropriated for those Services by a sum of £85,437,384 9s. 2d which is chargeable to the Vote of Credit;

(b) That the aggregate receipts in aid of Air Services exceeded the aggregate sums appropriated in aid of those Services by a sum of £1,030,938 15s. 2d., to be surrendered to the Exchequer.

And whereas, as shown in the Schedule hereunto appended, the Lords Commissioners of His Majesty's Treasury have temporarily authorised the application, so far as necessary, of the excesses of the sums realised on account of Appropriations-in-Aid of Air Force Votes 1 to 4 and 6 over the sums which may be applied under the Appropriation Act, 1918, as Appropriations-in-Aid of those Votes, to make good the deficiency of Appropriations-in-Aid of Votes 5 and 7."

3. Resolved, That the application of such sums be sanctioned.—[Mr Baldwin.]

SCHEDULE.

Number of Vote.	Air Services, 1918-19. Votes.	Actual Receipts compared with Estimated Appropriations-in-Aid. Surpluses. £ s. d.	Deficits. £ s. d.
5	Air Ministry	—	94 15 2
7	Half-Pay, Pensions, and other Non-Effective Services	—	100 0 0
1 to 4 and 6	Other Air Force Votes	1,031,133 10 4	—
		£1,031,133 10 4	£194 15 2
	Surplus	£1,030,938 15 2	

The Resolution was reported, on Aug. 4th.

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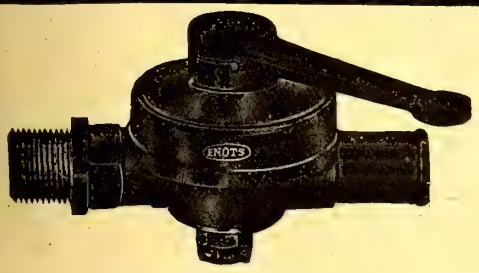

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FLYING SERVICES FUND.

A meeting of the Flying Services Fund Committee was held on Friday, July 30th, 1920, when there were present: Group-Captain C. R. Samson, C.M.G., D.S.O., R.A.F (in the Chair), Lieut.-Col. A. S. W. Dore, D.S.O., Mr. Chester Fox and the Secretary

APPLICATIONS FOR ASSISTANCE.—Forty-nine applications for assistance were considered, and grants and allowances voted amounting to £751 5s. 6d

RACING COMMITTEE.

A meeting of the Racing Committee was held on Wednesday, Aug. 4th, 1920, when there were present: Group-Captain C. R. Samson, C.M.G., D.S.O., R.A.F. (in the Chair), Mr G. B. Cockburn, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Col. F. Lindsay Lloyd, C.M.G., C.B.E., and, in attendance, B. Isaac and H. E. Perrin, Secretary.

The question of holding a further Race Meeting this year was discussed

COMMITTEE MEETING.

A meeting of the Committee was held on Wednesday, Aug. 4th, 1920, when there were present: Brig.-Gen. Sir Capel Holden, K.C.B, F.R.S. (in the Chair), Major-Gen. Sir Sefton Brancker, K.C.B., Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. F. K. McClean, Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., and the Secretary

ELECTION OF MEMBERS.—The following New Members were elected:—Major Charles Francis Abell, Hon. Capt. Charles Bernard Bond, Major Charles Noble Draper, R.A.S.C. (S.R.), Eric Thomas Haulton Ellis, Henry Peter Henry, Flying Officer Robert Frederick Charles Metcalfe, R.A.F., Stanley Claude Peacock.

TEMPORARY HONORARY MEMBERSHIP.—Lieut. John Jay Ide, U.S.N.

FEDERATION AERONAUTIQUE INTERNATIONALE.—The Conference of the F.A.I. will be held at Geneva on the 8th, 9th, and 10th Sept. next, and the Club will be represented by Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. F. K. McClean, Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., and H. E. Perrin, Secretary.

FLYING SERVICES FUND.—The report of the meeting of the Flying Services Fund Committee held on July 30th, 1920, was received and adopted.

BRITISH RECORD.—The following British Record was passed:

CLASS "C" No. 4b. GREATEST SPEED.

Over a Straight Line Course of One Kilometre.
(Fédération Aéronautique Internationale.)

Type—Nieuport L.S.5.
Constructor—The Nieuport and General Aircraft Co., Ltd., London.
Motor—340-h.p. A.B.C. "Dragon Fly 1A."
Pilot—L. R. Tait Cox.
Place—Martlesham Heath, Suffolk.
Date—June 17th, 1920.

Greatest Speed (being the mean speed of four runs in accordance with the Regulations of the Fédération Aéronautique Internationale), 267.7 Kilometres per hour (= 166.4 Miles per hour)

AVIATORS' CERTIFICATES.—The following Aviators' Certificates were passed:

7876 (Hydro-Aeroplane) Alfred Cuckson Meredith, Nov. 7th, 1918; 7877 Arthur Robert Cole Holland, June 13th, 1920, 7878 Cyril Ralph Catesby, June 22nd, 1920; 7879 Miss Imelda Mary Trafford, June 24th, 1920; 7880 Frank Crossley Broome, Dec. 27th, 1917; 7881 Thomas Henry Andrew Vivers, May 2nd, 1918; 7882 John Eric Hartley Bibby, Oct. 11th, 1916; 7883 Edward Douglas Whitehead Reid, July 27th, 1920; 7884 Leonard Gorringe, July 31st, 1920.

FLYING MACHINES FOR THE USE OF MEMBERS.

The Club has arranged with the Aircraft Disposal Co. for the exclusive use of six flying machines for the Members The following types are included in these machines: Sopwith "Pups," Avro, B.E.2d, and Armstrong-Whitworth. These machines will be kept at the Handley Page Aerodrome, Cricklewood, and will be available for use by the Members in about a fortnight's time

The fees payable will be £5 per hour, flying time, inclusive of petrol and oil and insurance, with a minimum payment of £2. Full particulars will be issued later. All inquiries relating to hiring should be addressed to the Club.

JACQUES SCHNEIDER RACE.

The race for the Jacques Schneider Cup has been postponed until Sept. 18th and 19th, 1920. The Royal Aero Club is offering additional prizes of £250, £150 and £100, to be awarded respectively to the British Competitors completing the Course, in the order of their official placings.

GORDON BENNETT AVIATION CUP.

This race will be held at Etampes on Sept. 28th next. It is hoped that Great Britain will be represented by three Competitors, and the names will be announced shortly.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, July 30th.

ROYAL AIR FORCE.—ADMINISTRATIVE BRANCH.—Sqdn. Ldr. A. R. Woodland (Qr.-Mr. (Hon. Maj.), King's Shrop. L.I.), having retired from the Army, and relinquished his commn., is granted the rank of Lt.-Col.

TECHNICAL BRANCH.—The following are granted temp. commns. as Capts., Grade (B.): C. M. Alport (Lt., R. Highrs.), H. C. Kinred (Lt., Glouc. R.), April 1st, 1918.

MEMORANDUM.—Lt.-Col. J. Starling (Qr.-Mr. and Capt. Gen. List), relinquishes his temp. R.A.F. commn., on retirement from the Army, and is permitted to retain the rank of Lt.-Col., August 1st.

AIR MINISTRY, August 3rd.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The date of appt. of Flight Lt. L. L. MacLean to a permanent commn. (A.) is July 22nd, and not as stated in the "Gazette" of August 1st, 1919.

SHORT SERVICE COMMISSIONS.—Flight Lt. G. H. Walker (A.) resigns his short service commn., and is permitted to retain his rank, August 4th.

The following Flying Officers resign their short service comms., and are permitted to retain their rank: F. N. Whiteley (A.), July 20th; C. Eaton (A.), July 23rd.

RE-SECONDING.—Observer Officer R. E. W. Sandall (Lt., Lincolnshire R.) is granted a temp. commn. on re-seconding for a period of two years, July 30th.

FLYING BRANCH.—Pilot Officers to be Observer Officers: G. Lansdowne, D.F.C., October 1st, 1919; W. J. Harris, January 27th.

Flying Officer A. H. E. Lindop, M.C. (Capt., Indian Army), relinquishes his temp, R.A.F. commn. on reverting to Indian Army, June 26th. (Substituted for notification in the "Gazette" of July 9th.)

AIR MINISTRY, Aug. 6th.

ROYAL AIR FORCE.—SHORT SERVICE COMMISSIONS.—Flying Officer E. A. B. Urmston (A.) resigns his short service commn. and is permitted to retain his rank, Aug. 7th.

MEMORANDUM.—Sqdn. Ldr. S. J. Goble, D.S.O., O.B.E., D.S.C., is granted the hon rank of Wing Comdr. whilst empld. with the Commonwealth Government of Australia (Royal Australian Navy), Aug. 1st, 1919.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATHS.

HAVELOCK-SUTTON.—In hospital at Halton Camp, on July 30th, Capt. George Havelock-Sutton, M.C., King Edward's Horse and R.A.F., the result of wounds received in action in 1916.

ORDE.—Flight Lt. Michael A. J. Orde, R.A.F., who was killed in an aeroplane accident on Aug. 5th, was the eldest son of Sir Julian and Lady Orde.

Flight Lt. M J. Orde joined the R.F.C. early in the war and was shot down and taken prisoner by the Germans in 1916. Recently he was posted to the Central Flying School, Upavon, that he might pass his Service machine tests. On Aug. 5th he flew in a dual-control Bristol biplane, accompanied by an instructor Shortly after taking off, the machine "stalled" on a turn and crashed to the ground. Flight Lt. Orde broke both his legs and fractured his skull. He was killed at once. It was stated at the inquest on Aug. 7th that he held the controls so tightly that the instructor was unable to take charge of the machine.

Sincere sympathy is felt for his relatives.

PALMER.—Flying Officer Robert Daniel Cecil Palmer, D.F.C., R.A.F., who was killed on Aug. 2nd in Mesopotamia, was the son of Mrs. Caroline Dudley Palmer, of St. Leonard's-on-Sea. He was 22 years of age.

STRONACH.—On July 19th, at a sanatorium, Edward Pellew Wilson Stronach, late Lieut., R.N.V.R., attached R.N.A.S.

All those who were concerned with aviation in its early days will remember "Ted" Stronach as one of the pioneers of aviation. He first became practically concerned with flying when he worked in conjunction with Mr. Kenneth Rankin on Mr. James Radley's Blériot monoplane at Huntingdon in 1910. Later he assisted the late W. B. R. Moorhouse, also at Huntingdon, and in 1911 joined Mr. Oscar Morison in his work with his Morane monoplane. Subsequently he entered the employ of the Bristol Company and had a large part in the successful running of their engines.

During the war he became a Lieut., R.N.V.R., attached R.N.A.S., as inspector of aircraft material and production, and was for some considerable time attached to Short Brothers' factory at Rochester as an inspector of seaplane production.

After a year or so of this work he developed tuberculosis and in the later stages of the war had to retire from the Service and lived in the country in the hopes of recovering. Unhappily he took his ailment in hand too late and gradually became worse and worse, till on July 1st he entered a sanatorium near London, where he died shortly afterwards.

Ted Stronach was not only an extremely able mechanical engineer and particularly talented in the care and maintenance of aero-engines but he was personally one of the most popular men who have ever been concerned with aviation. Of him it may be said, as of very few others, that he had no enemies.

He had an enormous capacity for hard work and an equally great capacity for enjoyment. If one wanted a machine put together and an engine tuned in the shortest possible time, Ted Stronach was the man to put in charge of the job, for no matter what or who his assistant might be, one could rest assured that he would do with his own hands what was beyond the ability of his assistants. And if one wanted to spend a cheery evening free from the cares of aviation business, one could not wish for a more amusing companion than Ted Stronach. He was, in the vernacular of the aviator, "always full out."

If he had few of the qualities which lead to greatness he had at any rate all the qualities which result in a man leaving behind him many friends who regard the earth thereafter as a poorer place because of his absence.—C. G. G.

MARRIAGE.

POOLE—CRAFT.—Flying Officer Charles John Poole, R.A.F., eldest son of Mr. and Mrs. J. C. Poole, of Wimbledon, to Dorothy, the only daughter of Mr. and Mrs. C. Craft, of Westminster, London, at All Saints' English Church, Cairo, Egypt, July 2nd, 1920.

EMPLOYMENT.

[Except where addresses are given, communications should be sent c/o THE AEROPLANE, 175, Piccadilly, W.1.]

Situation required—observer, mechanic, or ground engineer. Experience: pre-war knowledge of rotary engines, four years R.A.F. observer.—L. C.

COMING EVENTS.

AUGUST.

25th, Wed., 26th, Thurs.—R.A.F. *v.* Army Cricket Match at the Oval.

SEPTEMBER.

1st, Wed.—British Government Competition, Amphibian Competition at Felixstowe.
8th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva.
18th, Sun, 19th, Mon.—Schnieder Cup Race at Venice.
27th, Mon.—Gordon Bennett Aviation Cup Meeting near Paris begins.

OCTOBER.

2nd, Sat.—Gordon-Bennett Aviation Cup Meeting near Paris closes.
23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.

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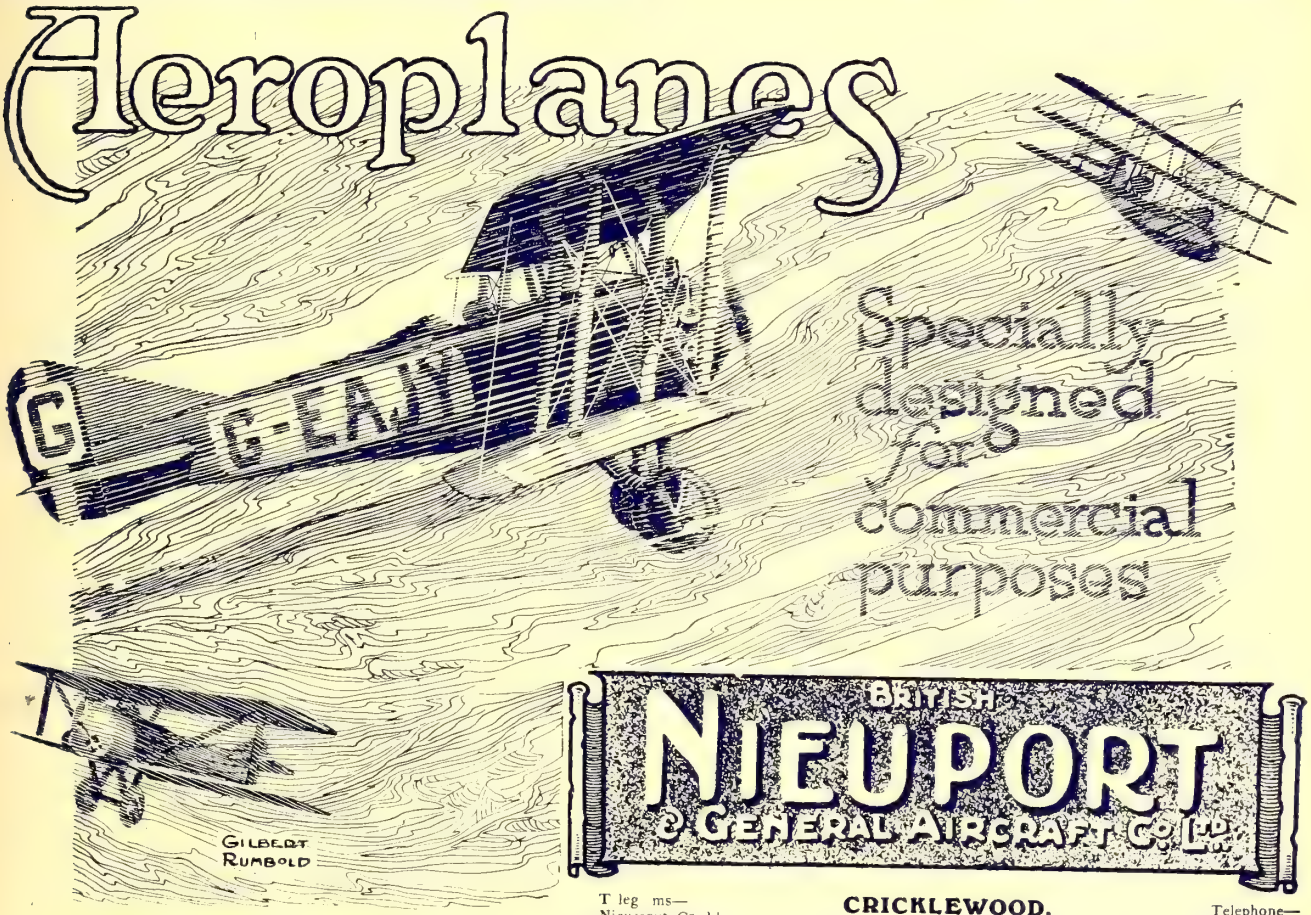

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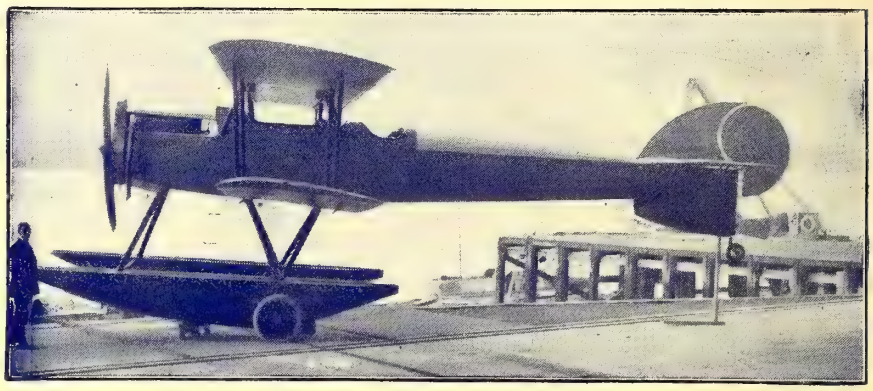

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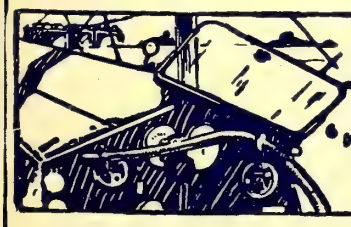

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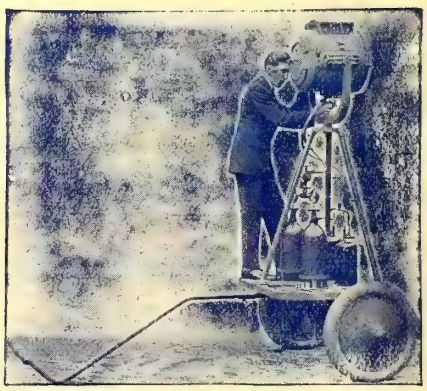

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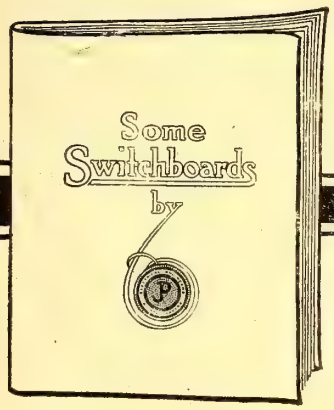

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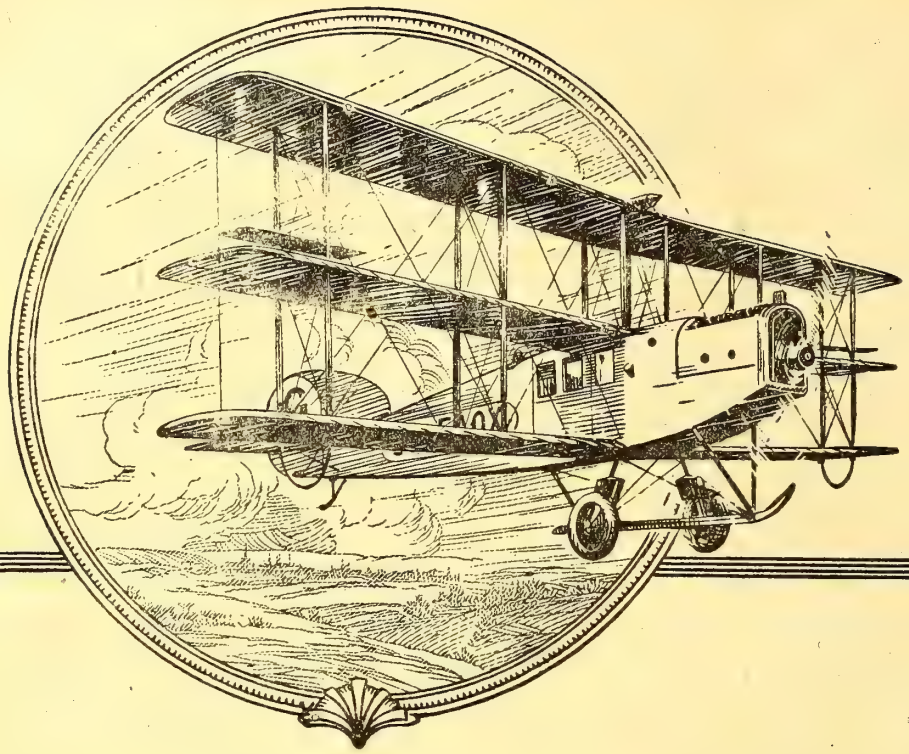

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ON SAFETY, COMFORT, AND ECONOMY.

When the well-meaning but mischanceous General Seely, then Under-Secretary of State for Air, decreed that there should be a Government Aeroplane Competition in 1920, doubtless the competition, with its £64,000 worth of prizes, was intended as what the French call a *beau geste*. As it has turned out, the competition is merely rather a good joke—which is not at all the correct translation of a *beau geste*.

The net result is that a number of more or less deserving and singularly pleasant members of the R.A.F. and the Aircraft Industry are having a healthy and happy holiday near the East Coast—which is "so bracing," *vide* posters. And a number of very hard-working and equally pleasant technical officers and officials of the R.A.F. and Air Ministry are doing a lot more hard work just when they ought to be going for their summer leave.

In fact, so far as one can see, they are going to get their summer leave some time in November, allowing that the Amphibian Section of the competition is going to last till the end of September and the compiling and printing of reports and passing of proofs is going to last till the end of October. After which doubtless the Department of Information will issue the completed reports as a Christmas present to the Aeronautical Community.

As some of the readers of this paper may not wish to wait till Christmas before learning something about the competition, it seemed well that one should go down to Martlesham and see whether one could discover anything of serious interest before Christmas. Certainly there is no lack of interest about the affair, but whether it is of serious interest is rather a matter of opinion.

The competition was initiated with the idea of producing some new types of machines which would increase the safety, comfort and economy of Civil Aviation. Actually it has collected at Martlesham a number of very nice aeroplanes which would have existed just the same if there had not been any competition at all. So the Air Ministry might just as well have kept its £64,000 in its pocket, but for the fact that "competition is good for trade," and presumably the winners of the prizes in the different classes will profit thereby in one way or another, besides receiving the prize money.

From which remarks the reader may gather that there is nothing new or original about the competing machines. Which is perfectly true if one considers the list of entries.

The Gros Porteurs.

Consider the heavy-weight class, officially called the "Large Type" class. In the French Government Competition this is called the class of the *"gros perteurs,"* which one, G.D., insists on translating as the "fat porters' class." Somehow the translation seems to fit it better than the correct title.

In this class we have the Vickers Commercial "Vimy," looking very like a fat porter and just as it, or another like it, flew at Amsterdam in September, 1919; the W.8 Handley Page, just as it appeared at the Paris Show in December, 1919, barring that it is a pale pea-green instead of white; and we have the Central Aircraft Company's "Centaur," a very pretty machine, which was designed in 1919 and has been flying for months. Also, as the last-mentioned has, with her two engines, less horse-power than one of the "Small Type" machines in her single engine, she hardly seems to be fairly placed in the large class, except as regards economy of power.

Here one may perhaps explain that the fat porters have to carry seven persons or more (excluding the crew), whereas the small type have to carry less than seven. Originally the scheme—as produced by the Air Ministry—was for the small type to be two-seaters (*id est*, pilot and passenger), and for the large type to carry fifteen passengers or more—which would have developed on the one hand the little runabout for the young man and his owner-driver, and on the other hand the big public-service vehicle. And that would have been quite sound.

Then, so one is told, the draft rules were sent up to the Society of British Aircraft Constructors to see whether the "Trade" would build and enter machines in those classes. According to the legend, the "Trade" said that its best machines did not come into those classes and it was not going to the trouble and expense of building special machines for the job. But that if the Air Ministry liked to alter the classes to suit the machines which already existed, the "Trade" would put up a show, and save the Air Ministry from being made ridiculous through having to cancel the competition.

So that is why the competition is more or less of a joke. Though one cannot help thinking that if the Air Ministry had held firm the joke might have been rather the other way round.

The Light Weights.

The "small" class bears out one's original assertion that the competition has not produced anything new. It is true that the Austin "Kestrel" (160-h.p. Beardmore) was designed for the original two-seater competition, but, though it is one of the very best two-seaters one has seen, the last person to claim that it is any radical departure from current practice would be Mr. Kenworthy, its able designer. The Beardmore (240-h.p. Siddeley "Puma"), with her duralumin structure *à la* Zeppelin, is another singularly interesting two-seater, but Mr. Tilghman Richards would have designed it just the same if there had been no competition. The Bristol (240-h.p. Siddeley "Puma"), as sound a job as are all Captain Barnwell's designs, is a modified Bristol "Coupé," a very good two-seater intended to meet and beat the original rules.

The Westland (450-h.p. Napier) is the logical development of the original Limousine to carry five passengers and pilot with 450 h.p., instead of three plus pilot with a 275-h.p. Rolls-Royce. She is a very beautiful machine and Mr. Robert Bruce could not have helped designing her, competition or no competition.

The Avro triplane (240-h.p. Siddeley "Puma"), which

came from the Aero Show, is certainly an example of economy, seeing that she is built entirely of standard Avro parts. Also she is probably as economical to run, and as safe and comfortable to fly as anything existing. But the mere fact of her being standard stuff washes out any claim to originality, for her parts were designed by Mr. Roe and Mr. Chadwick ages ago.

Finally the Sopwith, with her 180-h.p. Viper engine, is a very good machine indeed, with an excellent performance. She is safe and comfortable, but no more so than any Sopwith machine of the past, for safety and comfort account very largely for the famous 11,237 (or should we say 16,237?) Sopwiths having been ordered during the war.

The Lack of Progress.

To show any real advance over wartime practice we should have had new and original machines in the Competition. Somebody ought to have had the pluck to try a high-lift wing for example. The only approach to such a wing is in the Beardmore, but even that does not come anywhere near the Fokker or Junkers wings for depth of camber. For the Competition to be of the highest interest we should have had the Handley Page wing, at any rate in the form of an attachment to existing wings, if not in its ultimate shape. And we should have had the "Alula," and any other varieties of wing which will increase efficiency and so make for greater safety and economy.

If the Air Ministry wants to spend any money on competitions next year it might offer prizes for inventions, the said inventions to be demonstrated in actual use, and not merely on paper or as models. Quite a lot of useful information, besides much harmless amusement, could be extracted from such an affair.

A Certain Advance.

At the same time it must not be imagined that the present Competition is a failure, or that no advance has been shown by the "Trade" since the famous Military Aeroplane Competition at Lark Hill in 1912. Far from it, for, as one of the earliest of our military aviators remarked, in 1912 only one machine, the late Samuel Franklin Cody's, arrived by air and all the rest were built in the competition sheds, whereas this time—only eight years later—only one machine was built *in situ*, and all the rest arrived by air. Besides which, in the opinion of the said pioneer of military aviation, the present Competition is funny without being vulgar.

It is, in fact, a very refined and educative entertainment, and, thanks to the aforesaid hard-working technical officers, a vast number of illuminative data will be obtained which will be of the greatest value in the future when we desire to compare the figures of the safe, comfortable, and economical aeroplanes of the time to come with the machines of to-day.

THE COMPETITION DAY BY DAY.

First Impressions.

Perhaps the best way of explaining how the tests are done at Martlesham is to give a brief diary of the work there during a visit which extended from Wednesday evening last, Aug. 11th, until Monday morning. The table on page 358 gives the actual dates and figures for work done.

At the time of arrival the Central Aircraft Co.'s machine was doing a trial flight, as a preliminary to weighing in and starting to compete officially. She flew very prettily and looked well in the air. Then she was weighed, and a horrible tragedy was discovered, which deserves explaining.

Naturally all machines have to have an airworthiness certificate as they carry official observers in the course of the tests. The C.A.C. had been granted her certificate on the strength of her estimated weight, the certificate giving her the right to carry a certain total load, including the machine herself. When she was weighed officially it was found that she was something like 1,000 lb. heavier, and presumably correspondingly stronger, than the original estimate, so that by the time she was loaded up with petrol for 3½ hours' flying (the half of the seven hours' reliability test) she was up to the limit of load specified in her airworthiness certificate, and there was no room for either pilot or passengers.

Thus, as Mr. Hawker humorously remarked, she could only undertake two of the specified tests, namely, that for ability to stand unattended in a wind, and that for ability to fly uncontrolled, the latter test to be made by starting up the engines and letting the machine go without anybody aboard.

The next couple of days were spent by the C.A.C. people in trying to get the "Plimsoll line," so to speak, of their machine raised by the technical officials of the Department of Civil Aviation. This meant losing a large amount of perfect flying weather and much waste of time. All of which goes to show how important it is to rely on practice rather than theory, even in calculating the weight of an aeroplane.

Low-speed Flying.

In the evening, when the wind had gone down, the Avro triplane went up for her slow-speed test. The method of taking the slow speed really deserves an article to itself, on account of its simplicity and ingenuity.

To describe it briefly one may say that the machine flies over a *camera obscura* (if you know what that is) at a given height. Its image is reflected on a sheet of paper, and its course is plotted by an observer who makes a pencil dot at intervals of a second—given by an electric ticker. The height of the machine being known, the distance travelled in each second can be calculated from the known angle of the lens.

As there is almost always a breeze blowing at the given height (3,000 ft. in this case) it is necessary to allow for windage. This is done by the observer firing a Vérey light attached to a parachute. The smoke from the light, as the parachute drifts with the wind, is shown on the paper in the camera, and its course is also plotted against the ticker, and so the speed and direction of the wind at that height can also be calculated.

The wind direction may be with, against, or across the course of the machine, so a somewhat elaborate calculation may be necessary to acquire the precise speed of the machine through the air. But the technical officers at Martlesham have been playing this game for years, and their results are amazingly accurate. The machines in this test do two runs over the camera in each direction (four in all) so that the average must be quite close to actuality.

The tests are done in the evening so as to give the pilots every chance of putting up their best performance. If they were done in the heat of the day the bumpiness of the air, even at 3,000 ft., might seriously disturb the course of a machine which is sagging along on the verge of stalling. It is the fear of stalling in the effort to get the slowest possible speed which necessitates the test being made at such a height.

If a machine stalls and drops, that particular run does not count. The observer carries a statoscope to show whether the machine does drop or rise to any noticeable extent—for jerking the machine up and down would delay its progress over the course and would not show in the camera. Also a barograph shows whether the machine maintains its height throughout, and assures that it does not make a slow descent in a half-stalled state. Thus, you observe, the technical people make quite sure that the pilots do not play any tricks on them.

On this particular evening Capt. Hamersley took the Avro so wide of the camera that it was impossible to plot his course, and he had to repeat the performance early next morning before the wind rose.

The same evening Capt. Cockerell took the Vickers "Vimy" over the low-speed runs and did a very fine performance, getting the big machine down to less than 50 miles an hour. It was an awesome sight to see the "fat porter" sagging along with its tail between its legs, apparently scarcely moving, and with its engines sounding as if they were barely turning. Capt. Cockerell is an artist with those engines, for he seems to get them to synchronise so perfectly that one hears none of the throbbing sound which is usually associated with twin engines and is caused by their getting "out of step."

Self-Controlled Flying.

While the Avro was doing her abortive low-speed trial, the Bristol, piloted by Mr. Uwins, went up for her self-controlled, or, as it is more commonly called, uncontrolled, test. In this test the pilot has to take his hands and feet off the controls, under the eye of an official observer, and demonstrate that the machine can fly without human control for at least five minutes.

There has been considerable argument as to the utility of this test. The average pilot hates an inherently stable machine, for the more stable a machine may be by design the less amenable it is to human control, as a rule, though it is in fact possible to make a machine which is both stable and controllable.

Some pilots argue that though stable machines may have been useful during the war, in that if the pilot were hit the machine would fly itself and so give the pilot a chance of

recovering, as did actually happen in many cases, or would give the observer a chance of taking control, as happened in many other cases, there can be no use in having an inherently stable machine for commercial flying, when pilots are not going to be knocked out in the air. They say that a very stable machine cramps their style in landing if they have to dodge into a bad field.

Others say that an unstable machine was best in war, as it was easy to manœuvre, but that they prefer a stable machine for peace flying, because on a long flight they can let it alone and merely keep it on its course.

The Use of Stability.

Personally one is all in favour of the stable machine, even for war purposes. There is a certain gallant young officer, still in the R.A.F., who with his observer had thirteen Hun machines to their credit during the last year of the war, and they flew an R.E.8. Now the R.E.8, when flying all out, is about as manœuvrable as a railway train. But, as Captain C——, the pilot in question, explained when one asked him how he did it, if an R.E.8 is throttled to about 50 miles an hour it can be thrown about like a single-seater scout.

According to him most R.E.8 pilots were killed because when they were attacked by Hun scouts they opened their engines wide and tried to get away. Then they could not dodge, and became absolute "sitters" for the faster Hun machines. He himself throttled down to 50 miles an hour, at which speed no Hun scout could stay with him. When the Hun dived at the tail of the R.E.8 he was forced to go past it. If he passed on either side the observer got him with the rear gun, and if he went underneath the pilot stood the R.E.8 on its head and shot him as he came out below him.

But, for civil aviation the arguments are just as strongly in favour of a stable machine. The argument that the pilot can rest on a long journey is quite sound, but there is a purely commercial argument in favour of inherent stability which is still more powerful.

Most manufacturers hope sooner or later to do the bulk of their trade by selling machines to aerial transport firms. Now, when once those machines are sold their reputation will be largely in the hands of the purchasers. The maker cannot be sure that they will be kept in proper order—for all countries are not so careful about airworthiness as we are.

A Matter of Reputation.

Suppose, for example, a British firm sells several machines to some comic South American outfit, which tries to run them with native mechanics. It is highly probable that rudder and elevator and aileron wires will become frayed and break in the air owing to lack of proper supervision—in fact, one knows of an instance where a particularly good British machine was crashed abroad recently, fortunately without fatal results, simply through gross recklessness on the part of the pilot (a British pilot at that), who knew that a rudder wire was frayed, but insisted on flying with it in an unfit state, with the result that it broke in the air.

If the machine is inherently stable, both with the engine running and stopped, any moderately competent pilot can get down safely with one or two broken control wires, and the local people who hear of the incident will respect the British aeroplane accordingly. But if a wire breaks through the carelessness of the pilot or of the management of the air line, then the British machine will be blamed for the crash (for that is the obvious defence of the management against local hostility) even though a competent pilot might have saved the machine.

Therefore one is strongly of the opinion that all machines intended for commercial purposes, as distinct from machines built for private owners, should be able to fly more or less straight on a level keel with all controls left loose, the height being controlled by the engine alone.

In this Competition in particular one is strongly opposed to allowing pilots to lock or adjust their control levers or wires for the purposes of the uncontrolled tests. If the machines cannot fly with the controls loose then they should lose marks. Control-locking gadgets would be no use if the control wires were broken, and it is precisely to guard against the danger of broken controls that inherent stability is advisable.

Naturally adjustable fins and tail-planes do not come into the category of control-locking gadgets. They are not controls in the ordinary sense, for they are fixed surfaces which are merely set to trim the machine at the start and are left as set. They should, in fact, be encouraged. Both tails and fins should be adjustable from the pilot's seat, though very few machines have fins which can be so adjusted, and some of the competition machines have not even tails which can be altered while flying.

So much for the general idea of self-controlled or uncontrolled flying. On the evening in question (Aug. 11th) the Bristol insisted on doing a slow spin to the left when asked to fly alone, so she came down for minor adjustments, and it was then too late to make another attempt. Incidentally, she flew over the camera obscura while doing her trial, and the energetic officials therein started busily to plot the speed of her slow spin, under the impression that she was the Avro making an erratic course in her low-speed test.

High-speed Flying.

The same evening (Aug. 11th) the "Vimy" did her high-speed test. This is a comparatively simple affair, though measured by very elaborate instruments. These, like the camera obscura system, would need a special article to explain.

Briefly described, the machines fly at a height of 20 or 30 feet along a course past the front of two observation huts a mile apart. Each hut has a species of tape machine, on which electrically operated pens make ticks on the tape every second. As the machine passes the first hut the observer, watching through a slot in the window, presses a button and starts the pens going on the tapes in both huts, and as it passes the second hut the observer there stops the pens.

By this system the time of passing can be measured to less than one-hundredth of a second. There is, one imagines, the human factor to be considered, in that timing with ordinary stop-watches in athletic events has shown that each individual timekeeper has a personal lag between eye and hand which may amount to as much as a fifth of a second. This, being more or less a constant figure for the individual, does not matter when the same person is timing the start and finish of a race, but it occurs to one that it does matter a good deal when two different individuals are timing at either end of a course, so that accuracy to a hundredth in the instrument is rather discounted by the weakness of our poor humanity.

Still, as each machine does four runs over the course—two in each direction—doubtless the errors cancel out. And, anyhow, a fifth of a second on a mile course taken on an average of four runs cannot affect results materially.

As in the case of the low-speed tests, the effect of cross or head or following winds are calculated in arriving at final results. Each hut has a finely calibrated anemometer fixed at approximately the height at which the machines are supposed to fly, and the direction of the wind is given by a wind-vane. It is all very interesting, and all the work is done in a most painstaking way by the technical staff at Martlesham.

The Landing Glide.

Having done her self-controlled flight and her high-speed and her low-speed tests, the "Vimy" also did the landing glide on the 11th. In this test the machines have merely to land from a height of 500 feet with their engines switched off or throttled right down. It is perhaps the simplest of all the tests, as it is only what any pilot has to do every time his engine lets him down.

The test calls for no comment, other than that it might have been better to have insisted on a complete switch-off on all machines, just to see which engines would stop turning altogether and which would continue to revolve. Naturally this test was child's play to Capt. Cockerell, who habitually handles the "Vimy" as if she were a Sopwith "Pup," and generally sits her down with tail-skid and wheels all touching the ground at once so that she only rolls a few yards.

A Little Acknowledgment.

Lack of space forbids one to describe this week any more of the doings at Martlesham, but before ending this instalment one desires to acknowledge the very great kindness and courtesy which one received from everybody concerned with the Competitions, and one knows that the competitors, whether owners, pilots, or mechanics, wish to express publicly their appreciation of all that the Judges and the Secretary and the technical officers and the official observers have done to make the tests not only interesting but thoroughly enjoyable. Naturally the fact that nearly all the "Trade" pilots have served as brother officers with some or other of the official people makes some difference as compared with the 1912 Trials, but, writing as a mere civilian oneself, one can bear witness to the fact that the whole atmosphere of Martlesham is one of combined keenness and good fellowship.

During the whole of one's visit one did not hear a single complaint from anybody about anybody else. No competitor grumbled at any instruction or decision of the Judges or observers, or at any result published by the technical staff. And the Secretary, because of his devotion to everybody's interests except his own, has won the highest regard of those few people who did not previously know him well enough to have awarded him already full marks in their list of esteemed friends.

An Unjustified Grumble.

Something has been written somewhere or other in the way of complaint about the high prices charged at the Aerodrome Hotel by the caterers, and the management of the Competition

is apparently blamed for the expense. It is true that the Army and Navy Stores, who are running the hotel, are charging high prices, but one cannot run a hotel in a wilderness for an entirely unestimatable clientèle at the prices of a Lyons' café in Fleet Street.

The position may be gauged by the fact that none of the local caterers in Ipswich or Felixstowe would look at the proposition at any price, and several experienced London firms also refused to consider it. The Army and Navy people took it on, and they are doing it very well. At any rate, nobody is complaining of the quality of the food.

When one remembers that at the most optimistic estimate the present £1 is only worth what 10s. was before the war, it strikes one that the 3s. breakfast, the 5s. lunch, and the 8s. 6d. dinner provided at the Aerodrome Hotel would have been remarkably cheap before the war at 1s. 6d., 2s. 6d., and 4s. 3d. respectively.

And those who do not care for such prices can always bring food in a paper bag and picnic on the Heath. There is plenty of room for them.

The Irrepressibles.

The worst complaint against the Hotel is that, being in fact the old W.R.A.F. Hostel, there are no doors to the cubicles, and so belated bed-goers find that strange things have happened to their little cots. For example, one pilot, who had had the misfortune to have the water-circulation of his engine mixed with the exhaust owing to a broken valve and to descend with a boiling radiator and with water hosing out of his exhaust-pipe, went to bed and found a whole fire-hose equipment reposing under his blankets, with a polite note to the effect that it might be useful the next time he went for his reliability tests.

When there is no flying the chief occupation of the inhabitants of the Hostel seems to be Nap, either in the somnolent or the cartomanipulatory sense, but one is told on the highest authority that in other places there exists a mysterious game known as "Seven-toed Pete," apparently imported to the Martlesham and Woodbridge district by way of the Pacific Ocean, which affords to some temporary inhabitants an opportunity of making hay while the sun shines, or rather after it has ceased to shine. People have been known to lose whole shillings in an evening's play.

Apart from such little *jeux d'esprit*, all in the best of good feeling, there are no complaints about the Hotel from the people most concerned—namely, those who live in it. And, as one has already indicated, the whole atmosphere of the Competitions is most cheery. It is a point of honour, almost, for every pilot to go up as a passenger in every other pilot's machine, and when the big passenger-carriers go for their tests they carry in addition to the official observers a dense population of rival pilots who happen to have nothing to do at the moment.

On these occasions the criticisms of the competitor's piloting are perhaps not entirely free from prejudice owing to the fact that the competitor as a rule proceeds to "put the wind up" the passengers (to use a colloquialism) in ways which can best be appreciated by professional rivals. Of which one may have a few tales to tell next week.

Machine and Pilot.	Date of Beginning Trials.	Weighed.	Examina'n.	High and Low Speed.	Reliability (7 hours) and Economy.	Self Controlled Flight.	Stopping of one Engine.	Landing (Glide).	Wind Test.	Landing and Getting Off.
Central Aircraft Co. (F. B. G. Castleman).										
Handley Page Ltd (Major Brackley).										
Vickers Ltd. (Capt. Cockerell). (Capt. Broom).	4/8/20	4/8/20		H.S. 11/8/20 102.73 m.p.h. / L.S. 11/8/20 49.63 m.p.h.	accepted 7/8/20 / $\frac{W}{G}$ = 6.33	11/8/20	Starboard 12/8/20 failed. / Port 14/8/20 succeeded	11/8/20		Get off 12/8/20 26.45 ft. / Landing 14/8/20 308 yards.
Austin Motor Co., Ltd. (M. D. Nares).	4/8/20	4/8/20		H.S. 6/8/20 109.96 m.p.h. / L.S. 9/8/20 45.1 m.p.h.		5/8/20		5/8/20		
W. Beardmore & Co., Ltd. (G. Powell)	7/8/20	7/8/20								
Bristol Aeroplane Co., Ltd. (C. F. Uwins).	3/8/20	3/8/20		H.S. 7/8/20 108.3 m.p.h. / L.S. 13/8/20 49.07 m.p.h.	accepted 12/8/20 / $\frac{W}{G}$ = 2.22	16/8/20		12/8/20		
Westland Aircraft Works. (A. S. Keep).	6/8/20	6/8/20		H.S 13/8/20 117.7 m.p.h. / L.S. 13/8/20 46.05 m.p.h.	accepted 12/8/20 / $\frac{W}{G}$ = 8.65	12/8/20		12/8/20		Get off 12/8/20 22.75 ft. / Landing 17/8/20 235 yards
A. V. Roe, Ltd. (Capt. Hamersley).	3/8/20	3/8/20		H.S. 4/8/20 95.7 m.p.h. / L.S. 12/8/20 51.5 m.p.h.	accepted 7/8/20 / $\frac{W}{G}$ = 3.63			4/8/20		Get off 12/8/20 1.18 ft. / Landing 14/8/20 239.1 yards.
Sopwith Aviation Co., Ltd. (H. G. Hawker).	3/8/20	3/8/20		H.S. 6/8/20 110.35 m.p.h. / L.S. 12/8/20 43 m.p.h.	accepted 4/8/20 / $\frac{W}{G}$ = 4.3	6/8/20		5/8/20		Get off 13/8/20 23 ft. / Landing 14/8/20 187.7 yards.

[NOTE.—The letters $\frac{W}{G}$ in column six of the table above indicate a measure of the efficiency of the machine and engine combined. W = the weight in pounds of useful load (either passengers or goods) carried on the Reliability Test, over and above the pilot (and mechanics, if any) and petrol and oil for 3½ hours' flying—approximately London to or from Paris against any ordinary wind. G = the number of gallons of petrol actually consumed in the course of the two 3½ hour flights, or seven hours' flying in all, at a cruising speed of 80 m.p.h.

Thus $\frac{W}{G}$ represents the weight of useful load carried by one gallon for seven hours at 80 miles an hour. From this figure one can arrive at any other figures of costs desired, such as ton-miles per gallon, or ton-miles per penny. Thus a $\frac{W}{G}$ of 8 would indicate that one gallon would carry 8 lb. to Paris and back in that particular machine, or 16 lb. to Paris only, at 80 m.p.h. Which would mean, at 4s. per gallon for petrol, a cost of 3d. per lb. for fuel alone.—C. G. G.]

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Meantime, one thanks everybody concerned with the Competitions for a few very happy days away from the cares of an office and in the free atmosphere of an aerodrome, as amusing as in the old days before the war and very much more interesting in that one can now see the definite objects for which we are all working.—C. G. G.

Post Scriptum.—At the time of going to press it seems that on figures and barring accidents the Westland will win the Small Class prize, with the Sopwith a very fair second. The Austin has been laid up with a broken valve, which damaged a cylinder. She will be flying this week, but being only a two-seater she cannot well win on marks for economy. The Beardmore has been hung up owing to a defective radiator, which, they say, held more solder than water. The Avro smashed her undercarriage in landing on Saturday (Aug. 14th), of which accident more will be said next week. The Sopwith damaged hers also about the same time. The C.A.C. has to fit new rigging to qualify for her airworthiness certificate for the load necessary for the Competition. And the Handley Page broke the trailing edge of her left upper plane after flying for 2½ hours in the reliability test on Saturday (Aug. 14th). Thus the "Vimy" seems likely to win the Heavy Class.

The enterprise of the ordinary British business man and his belief in aviation are very well displayed by the directors of the B.S.A.-Daimler combine who now own the Aircraft Mfg. Co., Ltd., and have ceased to manufacture new aeroplanes. They, or their nominee in charge of the Airco firm, withdrew their entry at the opening of the Competition. Yet the D.H.18—which is the big eight-passenger machine with a Napier engine—is about the only one which would have run close to the Westland for efficiency. It would probably have been beaten in the get-off and landing tests, but it would have scored on load carried $\frac{W}{G}$ and speed, and so would have stood a very good chance of winning. Yet the new owners would not even go to the expense of letting one of the existing machines compete, although all petrol and oil is supplied by the Air Ministry and the only expense involving on the owners would be the keep of the pilot and mechanics during the competition.

Apropos mechanics at the Competition.—All people belonging to the machines are supposed to wear a yellow armlet bearing the letters A.M.C., which stand for "Air Ministry Competition." An innocent visitor who asked the meaning of the initials was told that they stood for Air Muck Cannick, and went away wondering at the Air Ministry's new notions of phonetic spelling.—C. G. G.

(To be continued.)

THE FIRST INTERNATIONAL AERO EXHIBITION AT PRAGUE.

The following communiqué has been received :—

"The Czecho-Slovak Aero Club will arrange from October 23rd to November 2nd the First International Aero Exhibition in Prague, under the protectorate of the President of the Czecho-Slovak Republic, T. G. Masaryk.

"This exhibition will be a society event in view of the importance which is attached to the future development of aviation on Central Europe. Prague is to be the junction of all the projected aerial lines of Europe, and will no doubt become the centre of the Continental aerial life.

"Nearly all big firms of the neighbouring countries show a considerable interest as regards the exhibition, and have already promised their participation. Actually there is at Prague a big aerodrome under construction. The preparing of the exhibition especially interested that passenger and freight-carrying machines shall be shown numbers.

"For all information please apply to the Management of the Exhibition, Prague-Vinohrady, Slezska 18, Republic Czecho-Slovak, Europe."

[In view of the importance of Central Europe in any scheme of international aviation, it is to be hoped that some English firms will at any rate show sufficient enterprise to send a machine or two to Prague, just to uphold the credit of the British Aircraft Industry.—C. G. G.]

THE POST OFFICE AND AIR MAILS.

The Postmaster-General has made the following important alteration in the conditions affecting the air mail to the Continent. In future every packet intended for transmission by air mail must bear in the top left-hand corner a special blue label inscribed "By Air Mail." These labels can be obtained free of charge from any head post office or on written application to the Secretary, General Post Office, London, E.C.1. Packets for the air mail should on no account be sent under cover to the Postmaster at Croydon.

This and other detailed information in regard to the air mail is to be found in a special leaflet issued by the Postmaster-General. The leaflet can be obtained free from any post office.

All who have interest in the progress of aviation should get a copy, read it carefully, and endeavour to impress the advantages of the air mail on their friends.

[The following letter was sent to the Secretary of the General Post Office on Aug. 17th.]

Sir,—I have the honour to draw your attention to the fact that despite the paragraphs which have appeared in all the daily papers this morning pointing out that leaflets giving full information regarding air mail services may be obtained on application at any head or branch post office, it is impossible to obtain either the said forms or the special blue labels which should be affixed to the left-hand top corner of every packet to be sent by air mail.

I have endeavoured to obtain both the leaflets and the labels at the Post Office in Church Street, Piccadilly, and at the Post Office in St. James's Street. Both these post offices state that they have no knowledge of such leaflets or labels other than the knowledge gained from to-day's newspapers, and they furthermore volunteer the information that they do not expect to have any for at least a fortnight in view of the fact that it is customary for district post-offices to receive new forms and leaflets not less than a fortnight after the issue of such forms and leaflets has been announced to the public.

I venture to suggest that it is not in the best interests of air mail services that the public should thus be led to imagine that letters cannot be sent by air mail without the aforementioned blue labels and find on application that the said labels are unobtainable. The logical assumption in such a case must be that letters without the blue labels will not be dispatched by air mail and therefore that it is foolish to attempt to send letters by air mail until these labels are obtainable.

I have the honour to be, Sir,
Your obedient Servant,
C. G Grey
(Editor, The Aeroplane).

[Still later efforts to obtain leaflets and labels (at the West Central Head Office) elicit the information that they can only be obtained at St. Martin's le Grand.—C. G. G.]

BUSINESS IN CHINA.

The following communiqué, issued by the Department of Overseas Trade, should receive careful attention from firms anxious to attain commercial success in China :—

Mr. H. H. Fox, C.M.G., F.R.G.S., His Majesty's Commercial Counsellor for China, who has recently arrived in this country, is at present at the Department of Overseas Trade interviewing firms in London who are desirous of obtaining information as to the possibilities of extending their trade in China, and who wish to take this opportunity of consulting him on any matters connected with their business with that country. London firms who are desirous of consulting Mr. Fox should communicate with the Department of Overseas Trade, 35, Old Queen Street, S.W.1.

It is proposed, in accordance with the established practice, that a tour shall be undertaken by Mr. Fox of certain industrial areas in the United Kingdom, during the months of September and October, when the following cities will probably be visited :—Coventry, Birmingham, Wolverhampton, Leicester, Nottingham, Sheffield, Manchester, Leeds, Bradford, Belfast, Glasgow, Newcastle, Hull.

Mr. Fox will be pleased to meet manufacturers and merchants who wish to consult him in regard to steps to be taken for opening up trade with China, and who are desirous of obtaining advice and information as to the state of trade in that country. Among the matters in regard to which he will be prepared to give information and advice are the general state of trade in China, appointment of agents, methods of marketing and distribution of goods, terms of payment, statistics of imports, rates of Customs duties and general information as to openings existing for British goods.

Provincial firms desirous of meeting Mr. Fox should communicate either with the Department of Overseas Trade, or with the Secretary of their local Chamber of Commerce.

Mr. Fox has had extensive experience of trade in China, having first been appointed a student interpreter in that country in the year 1890.

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[The R.A.F. Appointments and Personal Notices will be found on p. 394.]

NAVAL

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—
Aug. 10th.—Act. Lieut.—R. M. R. Hoare, to *Pegasus*, Aug. 9th.
Aug. 12th.—Commr.—G. E. Ridgway, D.S.O., to *Eagle*, Aug. 11th.

Railway Warrants.

The Admiralty announced on Aug. 11th that junior Naval officers who are transferred to the R.A.F. Cadet College, Cranwell, will be given railway warrants to Cranwell upon application to the Accountant-General (Branch 8) provided the journey involved does not exceed in distance the journey which would have been performed had the officers proceeded direct from their last place of duty. If the officers proceed direct from one of H.M. ships or Naval establishments, the warrants are to be issued locally. In cases where the distance is greater, the officers should make their own arrangements and claim a refund of the fares incurred through the Air Ministry to the Accountant-General. This will be adjusted on the basis of the cost of the Government rate journey.

AIR FORCE.

The Mesopotamian Affair.

In an official résumé of the situation in Mesopotamia issued in London on Aug. 12th it was stated that a flight of the R.A.F. from Bushire is under orders to proceed to Mesopotamia.

A Cruise.

On Aug. 11th H.M.A. R.32 left Howden for a day's cruise over the surrounding country. She passed over Sunderland about 12.50 hours and returned to Howden in the evening.

Didsbury Aerodrome.

The Manchester Watch Committee, acting on a letter received from the Air Ministry last January, have decided to ignore the Disposal Board and take possession of Didsbury Aerodrome. The Committee hope to use huts on the aerodrome as a barracks for those members of the Manchester Police Force who are houseless.

The Young Idea.

The Aircraft Disposal Co., Ltd., has presented to the 3rd Hampton (Middlesex) Troop of Boy Scouts a D.H.6 aeroplane fitted with a 90-h.p R.A.F. engine, in order that the scouts may be taught something of practical aviation. For some months past this troop has been instructed by one lately in the R.A.F. concerning aero engines and model aeroplanes.

IRELAND.

Sinn Fein Activity.

The following was issued on Aug. 15th by Headquarters, the Irish Command:—

At about 5.30 a.m. on Saturday, near Banteer, co. Cork, a military guard over a broken-down aeroplane was attacked and the sentry killed. The remainder of the guard immediately engaged their opponents and after a fight put them to flight. The military casualties were one killed and one wounded.

The assailants' casualties, according to the latest information, are believed to be four killed and at least three wounded.

[An unofficial account states that this aeroplane was forced to descend owing to engine trouble, but the crew was uninjured.]

DENMARK.

The Danish correspondent of THE AEROPLANE writes:—

Danish naval pilots recently carried out flights of longer distances than the home frontiers generally permit, when two Friedrichshafen seaplanes started on July 13th to repay earlier visits of Dutch and British colleagues, piloted by Lieuts. Lichtenberg, R.N., and Just. Rasmussen, R.N.R., with a mechanic and Lieut. Scheibel respectively as passengers. After an intermediate landing at Soendisborg with difficulties in obtaining petrol, Slesvig was crossed at great altitude, and the Dutch naval air station Helder, on Island Texel, reached at 5 p.m., with fuel exhausted owing to strong adverse wind. A start for Felixstowe the same day being too late, the seaplanes arrived at the latter station next day at 1 p.m. after a two hours' flight.

The return flight was carried out on July 25th, Felixstowe being left at 7 a.m., Helder being arrived at and left at 9.15 and 11 a.m. respectively, and Copenhagen being finally reached at 5 p.m.—HI.

FRANCE.

The Numbers of Aviation Regiments.

A new numbering of aviation regiments in the French Army has been adopted. Numbers 1 to 10 are allocated to pursuit squadrons, 11 to 20 to day bombing squadrons, 21 to 30 to night bombing squadrons, and above 30 to observation squadrons.

The present disposition of aviation regiments and aviation units in the French Army, renumbered under the present system, is as follows:—

Aviation regiments: 1st, Thionville; 2nd, Strasbourg; 3rd, Chateauroux; 11th, Metz; 12th, Neustadt; 13th, Avor; 21st, Malzeville; 22nd, Luxeuil; 31st, Tours; 32nd, Dijon; 33rd, Mainz; 34th, Le Bourget; 35th, Lyon; 36th, Algiers; 37th, Rabat; Ecole de perfectionnement des spécialistes de l'aviation, Bordeaux; Ecole de tir aérien et de bombardement, Cazeaux; Flying School, Istres; 1st Groupe d'ouvriers d'aviation, Dijon; Aeronautical technical inspection, Paris.

Aérostation: 1st Regiment, Versailles (1st battalion, Epinal; 2nd, Compiégne; 3rd, Paris); 2nd Regiment, Toulouse (1st battalion, Nevers; 2nd, Toulon; 3rd, Pirivas).

Anti-Aircraft Defence: 1st Regiment, Paris (detachment at Lisieux); 2nd, Sedan; 3rd, Toul; 4th, Lure; 5th, Sathounay. Central anti-aircraft establishment, Chartres.

A Flight of L.72.

On Aug. 10th, L.72, which was recently delivered to the French Government, left Maubeuge in the early hours of the morning and flew *via Paris*, which it reached four hours after the start, and Lyons to Quers, near Toulon. The total flight took 10 hours and 20 minutes, the odd 20 minutes being absorbed by aerial evolutions over the Parisian populace. L.72 is to remain stationed at Quers at the present.

GERMANY.

The Danish correspondent of THE AEROPLANE writes:—

The Poles have repeatedly fired incendiary bullets at the aeroplanes of the "Deutsche Luftrederei" transporting electors to the frontier divisions votings in East and West Prussia. Twice the aeroplanes were set on fire.

In one case the aircraft could land safely, but the other ended fatally, costing the life of Paul Schwandt, who had been on active service and was one of Germany's oldest pilots, having taken his ticket on a Grade monoplane on May 20th, 1911.

The Tondern Airship Shed.

Visiting recently the airship shed at Töndern the members of the Demobilising Committee valued the former at the considerable sum of 23 million marks, an inquiry being addressed to Denmark whether that country will take the shed over for this amount with the return of Slesvig. In case of decline the shed is to be taken down and the material to be sent to England.

The construction of the Töndern airship shed cost originally six million marks, the repairs after the British air attack in 1918 amounted to about 600,000 marks.

The Surrender of Civil Airships.

At the extraordinary general meeting of the Deutsche Luftschifffahrt A.G. (Delag), the president stated that the Allies had insisted upon the surrender of the commercial airships "Bodensee" and "Nordstern," not because they have been built in contradiction to the peace terms, but in demand for replacement of the "F" airships destroyed during the revolution. The request is not for the same number of ships, but for an equal cubic capacity. Thus when permitted again to build airships the Germans have to give up one of every three airships turned out, and thus the one showing the best performance.—HI.

ITALY.

The Italian correspondent of THE AEROPLANE writes:—

An Attempt on an Airship.

The most active folk here, as everywhere else, seem to be the thieving section of the community, no doubt owing to the dog-day slackness of those who normally expect to get their bread and butter by slow and laborious work. No doubt also that a few months' life in Russia will take the place of the cat o' nine tails for such as soon as our "rulers" modernise their methods. So to the tale of how some determined villains, armed with implements adapted to deal with wire entangle-

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ments and sentries moved to the attack of the Baggio dirigible sheds a short while back, optimistically supposed by the authorities to have been intent on stealing sparking plug and carburetter spares for their motor bikes! Luckily the sentinels were not raw recruits and quite up to the game. So the abstraction of an airship cannot yet be chronicled, though the trick has been played with aeroplanes recently *ad nauseam*.

Aerial Spoils.

Having failed in forestalling certain somewhat inaccurate reports bearing on the aeronautical booty assigned to Italy, Stefani now rectifies them as follows, from Rome, Aug. 3rd.

To France, England and Italy were assigned two Zeppelins each. Italy has obtained two vessels of the latest type and as big as her airship sheds can accommodate. The delay in the delivery of the vessels was asked for by Italy in order to give her time to prepare sheds for her own airships, which is why precedence in delivery was given to England. Neither of the Zeppelins assigned to France was ready on July 6th.

The aeroplanes and motors asked for by Italy and obtained are respectively 147 and 328. So now it is all quite clear.

Volunteers for the Tripoli Colony.

The *Corriere della Sera* states that the enrolment of volunteers in various regiments for service in Tripolitania and Cirenaica is now open. Among these one finds aviators, aviation-riggers and fitters and mechanics. On arrival in the Colony definitely posted to the regiment where their services are required the men will receive a lump sum varying from 250 to 1,300 lire. Men already in the services and civilians liable for military service or not may apply.

An Accident at Spezia.

An accident causing two fatalities occurred at the Spezia naval seaplane school on Aug. 4th, when a Savoia, piloted by a warrant officer—by name, Savona—sideslipped and sank. The body of the other occupant of the craft, an A.B. Seaman pupil, has not been found at the time of writing.

A Flight of T.34.

The airship T.34 left Ciampimo at 05.00 hrs. or thereabouts on Aug. 5th for Palermo, *via* Naples, and arrived safely at 10.50. The ship had a fair number of passengers on board, including the designers and engineers, and a full crew, commanded by Major Biffi, with two assistant commandants. After a stop of two hours the T.34 started back home where she arrived without incident at 21.30 o'clock. During the whole journey of 1,200 km., wireless communication with Ciampimo was maintained, and for some time with Palermo. In spite of the 100 passengers not being all on board, the trip, as a first serious journey, must be regarded as convincing in a vessel of distinctly new proportions and type.—T. S. H.

JAPAN.

The correspondent of The Aeroplane in Japan writes on July 9th :—

German Aeroplanes for Japan.

It is reported that the confiscation of German aircraft by the officials appointed by the League of Nations will be completed in August. Japan will receive her allotment along with the other nations. It is thought this will amount to 50 aircraft, including specimens of the best German makes.

Lieut.-Colonel Nishihama, Lieut.-Colonel Segawa, Captain Oka and Captain Sagawa are at present in Germany attending to this matter, while Captain Kodama and Seto left Japan on May 1st to receive Japan's allotment. They expect to return to Japan with the machines sometime before next December.

In preparation for this event Y.500,000 has been appropriated to build suitable sheds and hangars at Tokorozawa and Kagamigahara Army aerodromes for maintaining the craft when they arrive. Work on these will begin next month.

The Autumn Manœuvres.

Two battalions of the Flying Corps are expected to take part in the coming autumn manœuvres, but 150 h.p. Hall-Scott-engined tractor biplane is to be used this time, and instead of another type machines as usual. These machines were been designed by the authorities and have been built at Japan Aeroplane Works and Co., Gunma Prefecture.

Wireless Telephony.

The Navy Flying Corps recently has been arranged wireless telephone on the aeroplanes for purpose of studying to make conversation between from air to ground or ships on the sea, and all the times received great success.

The Budget.

The Diet of the forty-third session has been convoked to meet from on July 1st, and the Government has made up the following supplementary budget for the financial for our aerial enterprise.

	Yen.
War Department	8,220,000
Naval Department ...	12,218,000
Educational Department...	242,000
Total	Y.20,680,000

N. K.

POLAND.

The Polish War.

According to a recent issue of the *Berlin National Zeitung*, Polish aviators report that the entire reserve of cavalry of the Russian 16th army is concentrated between Vilna and Grodno.

Propaganda by Air.

Bolshevist aeroplanes operating over the Polish front on Aug. 6th dropped pamphlets stating that the Polish troops were beaten and asking them to imprison their officers and join the Bolshevist forces.

The Seizure of Aircraft.

The Polish Legation in London were informed that on Aug. 12th, upon the arrival of some damaged Polish aeroplanes at the Danzig station, several of the machines were seized by the Sicherheitswehr. The machines were guarded by one officer and fourteen men, but owing to the hostile attitude of the German workers the officer was forced to request the intervention of the British Authorities. The Polish Commissioner-General has brought the matter before the High Commission of Danzig.

SPAIN.

Captain Rojas, a Spanish military pilot, was recently killed in landing at Ceuta, Morocco, owing to the explosion of unused bombs. Captain Rojas had just returned from a bombing raid upon the rebels.

TURKEY.

On July 20th British seaplanes lent by the Royal Navy to the Greek Forces participated in the capture of the port of Rodosto. As the result of the fire from the ships and bomb-dropping and machine-gunning by seaplanes, the Turkish Nationalists retreated from the coast at full speed and the Greek Army was enabled to occupy Rodosto practically without opposition.

UNITED STATES OF AMERICA.

Aerial Shooting.

In August the National Rifle Meet will be held at Camp Perry, Ohio. The United States Army Air Service are sending aeroplanes to give demonstrations of aerial shooting and formation control by wireless. An official exhibit will be arranged on the meeting-ground and aircraft guns, bombs, anti-aircraft guns, aerial photographs, including photographic maps of the district, copies of which will be distributed free to the public, and many types of aeroplanes will be shown. The 1-pounder cannon for use in aircraft will be included. This gun fires 120 rounds a minute. [One merely wonders. —Ed.]

During the meet army aeroplanes will perform aerial acrobatics, will fly races, and will demonstrate the use of wireless control from the ground and from the air. A Fokker D.7 biplane captured during the war will be employed in the wireless part of the performance.

Fire will be opened at ground targets from aeroplanes and rocking nacelles on the ground will be used in some shooting competitions. The excitement in Ohio will no doubt be intense during these efforts.

Round the States by Avro.

Lieuts. Runser, Turner and Freeland, of the U.S. Army Air Service, are flying round the United States of America in an Avro biplane (130 h.p. Clergèt). It is their intention to cross every State in the Union and to visit every capital of each State, giving exhibition and passenger flights.

It is their policy never to stunt a passenger and in that way to educate the public that commercial aviation is a practical achievement. They expect to take a year in completing their flight and to average one State a week.

A Loss.

On July 19th the U.S. Naval airship D.1 and two privately owned balloons were destroyed by fire in their sheds at Akron, Ohio. The damage is estimated at 160,000 dollars (about £32,000).

"HAIRCRAFT" FOR THE STAGE.

Though one hates to keep harping on the activities of The Firm, one feels it one's duty to point out that the camels in "the Garden of Allah" are not included in the 16,237 machines. But as "Chu Chin Chow" was a war product, the camels in this play may be included in the 00037 of the Arabian list, and were possibly tested by the "god-pilot" of the *Daily Mail*.—G. D.

FOLDING WINGS.

One was recently discussing with an ex-R.A.F. officer the question of housing a particular type of giant foreign aeroplane, a problem which appeared to present difficulties on account of its size.

"But doesn't it fold?" one asked.

"Only in the air"! was the reply.—G. D.

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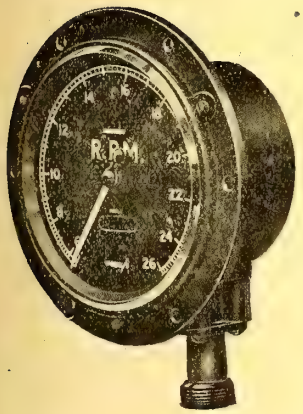

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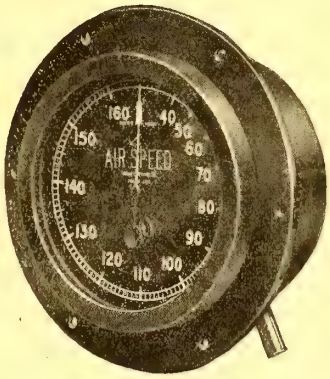

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Registering up to 2,600 revolutions per minute, these instruments are absolutely accurate in reading. Dials are graded on British scale and conform in every respect to the requirements of British standards.

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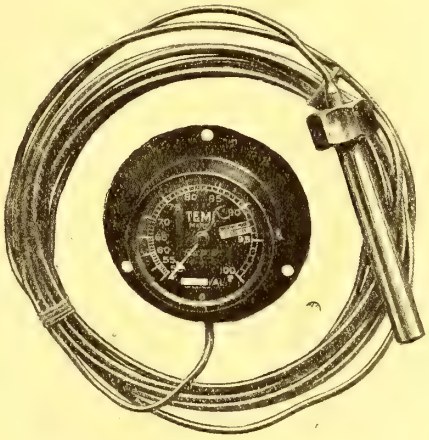

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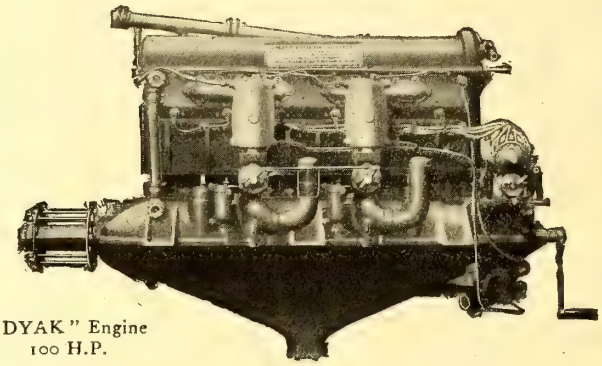

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100 H.P.

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THE WEEKLY COMMENTARY.

In a leading article, Captain Sayers discusses the ethics of State interference in industrial affairs, and deduces that the existence of the Royal Aircraft Establishment at Farnborough may be justified if that establishment really helps the development of British aircraft.

He also concludes that there seems to be a distinct likelihood of this occurring.

Descriptions and illustrations of some of the aeroplanes now competing at Martlesham for the Air Ministry Safety and Comfort competitions appear in this number.

A note appealing for a more graphic representation of the results of model tests of wing sections than that now usually employed appears on page 376.

THE R.A.E. AND THE AIRCRAFT INDUSTRY.

By W. H. Sayers.

The question as to whether or not the State as such should take an active part in the industries of its own country is often treated as a definite question of political principle, upon which one may hold either to the true doctrine or to the false.

In fact it is no such thing. If there be any definite principle involved it is solely as to whether it is more desirable that industrial organisations should remain small, confined to one branch only of industry and operated in competition with numberless other similar organisations, each for its own particular profit; or whether it is preferable that business should be in the hands of large organisations operating in a number of cognate or associated branches of industry and striving to obtain the maximum possible return from the associated businesses as a whole, rather than to advance one at the expense of the other.

Principles and Practices.

If the latter is the more reasonable and defensible method, obviously the operation by the State of the whole of the State's Industries for the maximum benefit to the members of that State as a whole is logically but one step on the way to an ideal world wherein the whole of mankind's energies shall be directed under a unified control for the benefit of mankind as a whole.

Whether such be a true or a false ideal, the whole of modern industrial development is in the direction of producing larger and larger industrial oganisations. Both the capitalist and the trade unionist are—each in their own particular way—moving towards the consolidation of loosely associated but interdependent industries under unified control and unified conditions of operation.

These two parties are at the moment in bitter opposition—an opposition which is inevitable whenever two densely—if differently—ignorant parties en route for the same goal meet by the wayside.

But they are so moving, and it seems definitely possible that their enmity will eventually force the State to interfere and take over the control of all industry.

Actually, there is no question of principle involved. If and when the State can take over and manage an industry better and more productively than can any private controlling body, then the State almost inevitably will take it over.

This point whereat taking over by the State will occur may be reached either by a growth of efficiency on the part of the Government, or it may—and seems likely to—occur as the result of a breakdown of private enterprise.

However that may be, even the most hardened anti-nationaliser acquiesces in the State management of certain very important enterprises. It seems fairly obvious nowadays that it is the business of the State to maintain law and order, to provide the organs of national defence, and to maintain the highways.

Industrialism Disguised.

It is claimed that such enterprises are not industrial undertakings—but in fact they are. Trading concerns such as the old East India Company, and the Chartered Company of South Africa, which were formed to exploit the resources of uncivilised parts of the earth, had of necessity to provide police and protective forces, not for the good government of the country, but for the safety of their own trading operations, and these formed part of their industrial organisation.

So it is in a civilised land. Roads, the order enforced by law and the police, and the protection afforded by the Navy and Army, form, in fact, conditions essential to the operations of every industry, and the organisation to secure peaceful operation in the industry and safe transport of their raw materials and of their products would form a necessary charge on the concern did the State not provide it.

The sole difference between these services which the State should admittedly undertake and others is that they are services which are necessary to the success of every peaceable form of enterprise and that they are services which can be more efficiently rendered by a single organisation for the benefit of all than by a number of competing organisations working in particular interests.

When man generally has reached a stage of intellectual development which permits him to realise that no industry has a clean-cut, separate interest, but is simply one of the factors which contribute to the life of the nation, and that the efficient operation of that industry is merely one of the common interests of the community, he will probably also have developed methods of running nationalised industries efficiently.

In the meantime there are a number of directions wherein the State may profitably attack industrial problems without incurring the wrath of those who believe that there is a matter of principle involved.

"A Kind of a" Principle.

The type of enterprise in question gives an important clue as to the "principle." Since such enterprises are invariably those from which no immediate profits are thought possible, it seems fairly obvious that the principle involved is an objection to the Government making profits, and that it is really based on the fallacy that there is some sort of limited store of possible profits in the universe, and that if the Government can manage to grab some of this store there will be less available for the objector.

Among the fields wherein it seems generally to be conceded that the Government may properly undertake what is really an industrial undertaking is that of research work bearing upon the development of aircraft.

Of the Nature of "Research."

Here, again, those who claim to be possessed of principles in this matter will object that research work is fundamentally different from industrial operations. Research is, in fact, merely a systematic effort to circumvent the difficulties under which industry labours, and the fact that research is so generally separated from industry is merely due to the fact that industry is too lazy and too greedy to undertake work whose profits will be long delayed, but is quite content to profit by the results of such work provided that they do not have adequately to compensate those who have carried it out.

This is very particularly true of British industry in general, and is very aptly illustrated by the action of some fairly large number of those who embarked upon the Aircraft Industry during the war and made fat and easy profits therefrom, but have promptly withdrawn therefrom—at least, in all but name—when it became obvious that continued active participation therein would involve hard work, imagination and patience.

There is a further reason why research work of this kind should be treated as a public service and not left to the enterprise of the individual. Research work is essentially speculative—both mentally and financially—and its speculative nature in the latter sense becomes more and more acute as the objects to which it is directed are more and more narrowed.

And Some of the Difficulties Thereof.

Research upon lines which at first seem to promise great results in one particular direction may prove at any stage to be productive of no result of value for its designed purpose. Similarly, apparently, unpromising fields of experiment may produce results of immense value. Research work of any kind may—often does—produce knowledge which is of very great value in fields of enterprise quite foreign to that towards which it was directed.

Therefore, research work, to be really efficient, should be carried on under unified control, independent of any specific branch of industry, that the results of such research may be available in whatever sphere they can profitably be employed, and in order to secure as far as possible that a line of research once proved valueless shall not be too often re-embarked upon through ignorance of the work of others on the same lines.

It must not be carried on with the sole object of earning immediate cash dividends, because research may properly and economically be directed to proving the practical impossibility of achieving certain results, and thus preventing the waste of time, of labour, and of materials in vain efforts to achieve them.

Further, research must be far-sighted; it should foresee the demands of the future and be ready with solutions for the problems which these demands involve when the demands arise. This means that research can only properly be carried out by an organisation of such vast resources that it can afford to attack problems which will not arise in practice for some long time ahead.

Thus research is very distinctly a matter properly to be undertaken by a body which is concerned with the welfare of the community as a whole, both in the present and in the future, and to be charged against the general wealth of that community.

A Case in Point.

These general reflections are the result of a recent visit to the R.A.E. at Farnborough, and of a query raised by a fellow-visitor as to what justification could be made for an annual expenditure of £300,000 on such an establishment.

Such a question is either extremely easy or absolutely impossible to answer in any concise terms.

An expenditure of this nature is justifiable solely by the fact that increased knowledge tending to the solution of the many problems to-day presented by the science of aeronautics is absolutely essential to the steady development of the Aviation Industry. It is justifiably an expenditure on the part of the State acting for the nation as a whole, because such a steady development of that particular branch of its industry is in the interests of the nation as a whole, and not the sole concern of any small section of that nation.

Whether the actual amount of the expenditure on this particular establishment is justified by the results actually obtained therefrom may be an entirely different matter, and is most certainly not definitely answerable at this moment.

The more particular question depends for its answer on a very large number of factors. It depends upon the policy which controls the whole establishment, whether that be directed by a wide and far-sighted sense of proportion, and upon the mental and moral calibre of those who compose the staff thereof.

A Basis for Judgment.

If a relatively long period of operations indicates that the researches there have been so directed as to cover problems of real importance, that the results obtained have provided useful solutions to practical problems, if it prove that the industrial application of aircraft has been really facilitated by the work of the establishment, and that the results of their labours have been rendered available to all those who are properly interested—then the answer will have to be in the affirmative.

If in, say, ten years' time there exists a healthy and prosperous Aircraft Industry and a R.A.E. with which that Industry is on intimate and cordial terms, then it is safe to say that no financial statement purporting to prove that the cash returns from the R.A.E. are inadequate need be taken seriously.

A fat, prosperous, and self-supporting R.A.E.—disliked and feared by the remnants of Industry—though doubtless easier to defend in any Parliament such as that which we now possess—would, on the contrary, be fair presumptive evidence that the expenditure on that establishment in the past had been unjustifiable.

A Good Start.

From an inspection of the work which the R.A.E. has at present in hand, it may be concluded that it has at least started along the right path.

Among the urgent needs of the immediate future, simple, reliable and economical aero-engines undoubtedly take a prominent place. To all intents and purposes the

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industrial concerns of this country have washed their hands of this problem, and it is, therefore, eminently one to which the State may properly turn its attention.

Air Cooling.

It is, therefore, satisfactory to discover that a very large amount of engine research work is in hand at Farnborough. During the war a great deal of experimental work on the air-cooling of engines was carried out here, and the existing high-power air-cooled radial type of engine to some large extent owes its being to that work.

That work continues, and as a result Farnborough, by a process which at first sight looks impracticable, has been able to produce air-cooled cylinders which are simpler to manufacture, give a greater output, and probably a lower fuel consumption that those which have so far been produced by private enterprise.

These R.A.E. cylinders are compound affairs, with the usual turned-from-the-billet cylinder walls and fins and aluminium alloy heads cast-on to the liners. The top of the cylinder barrel is fitted with circumferential and axial grooves which lock the cast-on head in place. One would have expected—in view of the habits of aluminium alloys when heated—that these heads would grow, become slack and leak after a period, but it appears that they give no trouble in this respect. Steel valve seats are cast into the aluminium heads, and here even, subjected as they are to perpetual hammering by the valves, no trouble has been found with loose valve seats.

In one case during the late war the design of an air-cooled radial engine was taken out of the hands of the originator, and entrusted to certain officials of the Technical Department.

Many hundreds of thousands of pounds' worth of these engines to altered but untried designs were ordered from firms having no experience of the type, and to all intents and purposes the engines delivered were useless. The R.A.E. have attacked the engine, they have successfully persuaded certain modified specimens to stand up for quite long periods, they have increased the output very materially, and there appears to be good reason to expect that they will eventually turn these hitherto useless engines into highly economical and reliable products.

Regarding the transaction as a whole it scarcely adds to the reputation of Government departments for business-like methods.

Taking solely the R.A.E. part in the affair they have at least appreciably reduced the total loss on the whole business, and they have in the process gained a large amount of valuable knowledge as to the habits of this type of engine in being.

An Important Problem.

Another line of engine research which may lead to results of even greater value than the solution of the problems of the air-cooled engine is that dealing with fuel injection into engine cylinders.

At Farnborough there is a single-cylinder air-cooled unit on test which has no carburetter, petrol being injected by pump into the cylinder itself. Engines have already been persuaded to operate on this principle—notably the old Antoinette aero engine, but even in this case the device was by no means satisfactory.

In certain hands the Antoinette engine gave excellent results, but it was never possible to run it throttled. At that time this was unimportant, because aeroplanes of that date would not fly with their engines throttled, but to-day such a partial solution of carburetter difficulties would be of no value.

Of the present experiments in this direction the results so far obtained are promising. A slight improvement in petrol consumption over that reached with a carburetter has been obtained, and the problem of throttling has shown signs of approaching solution.

Now of the many pressing problems confronting aircraft to-day that of the engine using some fuel less easily ignited than petrol is one of the greatest importance. Carburation in the present sense of the word is not practicable with heavy oils, and a satisfactory fuel injection system will remove one of the major difficulties to the use of such relatively fire-proof fuels.

These examples of the work now in hand in this particular department will give an idea of the possible value of the R.A.E.

The development of a simply constructed, efficient and reliable aero engine, devoid of the complications of water cooling, of carburetters, and capable of running on a heavy oil, would alone be an adequate return to the Aircraft Industry for several years of an annual expenditure of £300,000, and it is not the Industry alone which will benefit thereby—just as it is not the Industry alone which contributes the cost.

Other Researches.

In addition to this engine work, much other experimental work of almost equally important a nature is in hand. Such work as the testing of metal constructions for aeroplanes, of various types of variable pitch airscrews, investigation of the most satisfactory method of affixing the blades of such airscrews into their bosses, the carrying out of tests on engines at high altitude, are all of very great importance, and are all of them of a nature which can be carried out more conclusively, more completely and more rapidly in such an establishment as this than by the disjointed efforts of individual experimenters.

The Test of Efficiency

The sole method of judging whether such work is being carried on efficiently is firstly to consider whether the problems which are under attack are problems of real importance, which query can safely be answered in the affirmative, and secondly whether the results attained are fully, freely and honestly put before those who are interested therein.

If such results are being but partially revealed, and the personnel of the Establishment are allowed to keep to themselves for their own self-aggrandisement certain essential parts of the information they have acquired, then it will return to the old evil condition wherein it was before the war.

An Incentive.

Fortunately it appears that this is not the case, and that as at present controlled the R.A.E. is out to assist in every possible way the development of the Aircraft Industry as a whole. This, of course, is but natural if one suppose that those who direct it possess a reasonable amount of common sense.

If the Aircraft Industry develops within the next few years to an important and prosperous condition, it must be mainly concerned with civilian aerial transport.

The official full scale research department of the British Air Ministry, working on cordial terms with that Industry, cannot fail to become an extremely important branch of the country's service.

For that establishment to hamper the development of the Industry and to refuse to maintain friendly relations therewith would be obviously antagonistic to its own true interests.

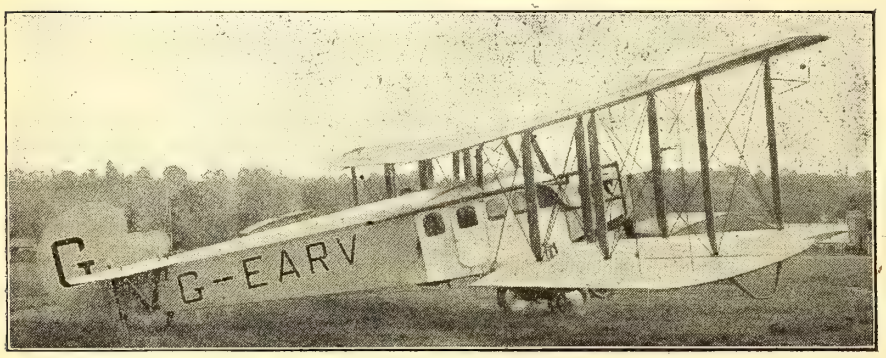
Those who have met Mr. Sydney Smith—the present Superintendent of the R.A.E.—will at least recognise that he possesses far too great an intelligence to embark on such a course—even were it not unthinkable that he would intentionally antagonise any fellow-worker in the task of developing aerial transport.

BEARDMORE

AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

SOME MACHINES AT THE AIR MINISTRY COMPETITIONS.



Three-quarter rear view of the Westland six-seater for the Government competitions. The large side entrance door to the cabin is obvious and it is just possible to see the position of the pilot from that of the wind-screen. One of the pair of trip wheels fitted ahead of the main wheels can just be seen below the wings.

THE WESTLAND SIX-SEATER.

This machine is an enlarged edition of the now well-known Westland Limousine, and the principles of construction which were so successfully used in the former have been employed in the larger machine.

The engine is the 450-h.p. Napier "Lion" which has already a reputation for reliability and smooth running.

The engine mounting is of tubular construction and extremely rigid. The whole engine unit is separated from the machine by a really fireproof bulkhead of asbestos covered with aluminium sheet. This is a point well worthy of notice, and throughout the design and construction every care has been taken to avoid any possibility of fire.

As a further protection the petrol tanks are carried under the wings. This the designers consider better than using any form of fireproof tank in the fuselage, and it also has the additional advantage of being readily accessible.

The question of accessibility and ease of replacement is one which has been carefully studied throughout the machine.

The Undercarriage.

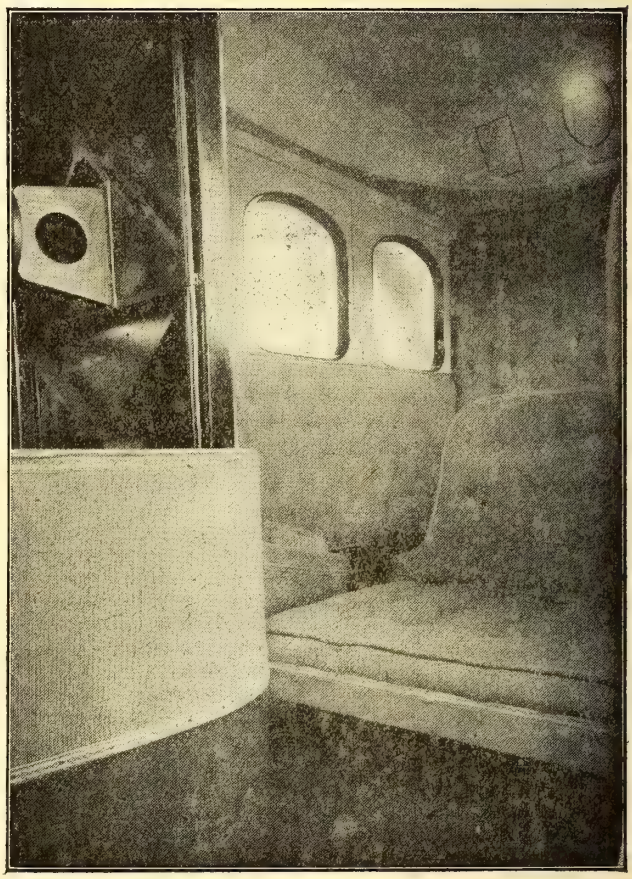
The undercarriage is worthy of special notice. It is very strongly constructed, at the same time having great shock-absorbing power.

The two rear wheels are fitted with band brakes operated by a lever in the pilot's seat. These brakes greatly reduce the length of run necessary after landing. There is no danger of putting the machine on its nose, as the leading wheels prevent any possibility of this.

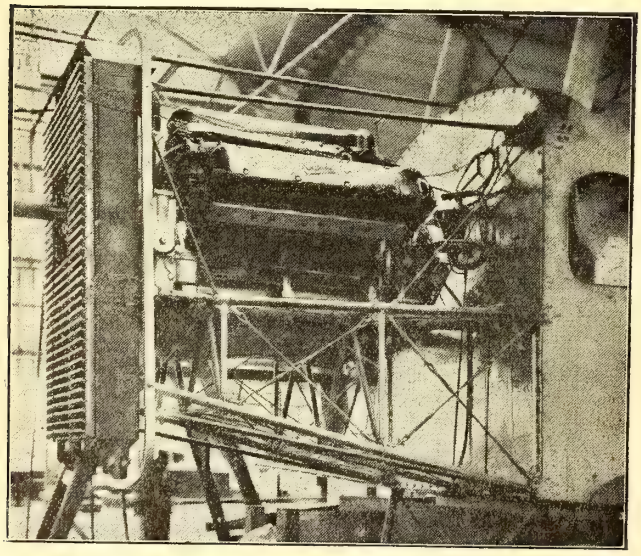
Accommodation.

The cabin is arranged for five passengers in addition to the pilot, who is raised slightly above the level of the passengers so that his head projects above the cabin roof, giving him a wide field of view, but at the same time he is in direct communication with his passengers.

The instrument board is directly in front of the pilot. In addition to the usual instruments there is a starting-gear by which he can put the engine in motion without leaving his seat.



In the Cabin of the Westland Six-seater.



The Napier Engine Installation of the Westland.

The entrance to the cabin for both pilot and passengers is through a large door in the side, and it is as easy to get in and out of as a limousine car. Eight "triplex" glass windows allow the passengers a splendid view, and ventilation is secured by a louvre which directs fresh air through a diffuser box into the cabin. The diffuser box effectively prevents draughts.

For heating in cold weather there is a hot-water radiator worked from the engine circulating system, and the temperature may be regulated at will by the passengers.

The upholstery is carried out in Bedford cord or other material which, in addition to making it comfortable, effectually damps out the noise of the engine, and conversation can be carried out without difficulty. Passengers who have flown in war-type and in converted war-type machines will appreciate the comfort and absence from noise and smell.

If used for goods-carrying, with the seats removed, over 1,000 lb. weight can easily be carried.

No ballast is needed in the machine whatever weight is carried from empty to full load, and the machine can be made to fly level at any speed by means of the tail-trimming gear operated by the pilot.

The touring speed of the machine is 100 to 105 miles per hour, and a maximum speed of 125 miles can be obtained. The minimum speed, owing to the low loading, is about 43

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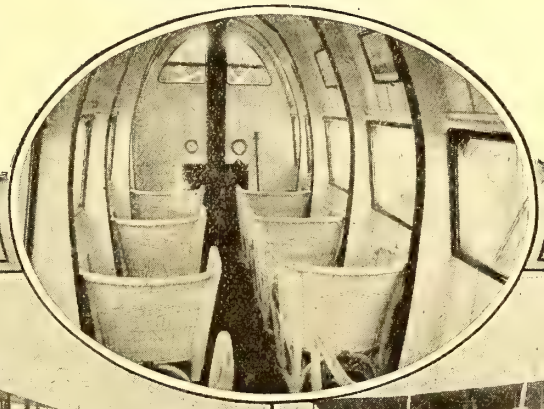

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miles per hour, which, in conjunction with the special undercarriage already described, greatly facilitates landing in aerodromes of limited extent.

Sufficient fuel is carried for 4½ hours' flight.

The principal dimensions are given in the table below : —

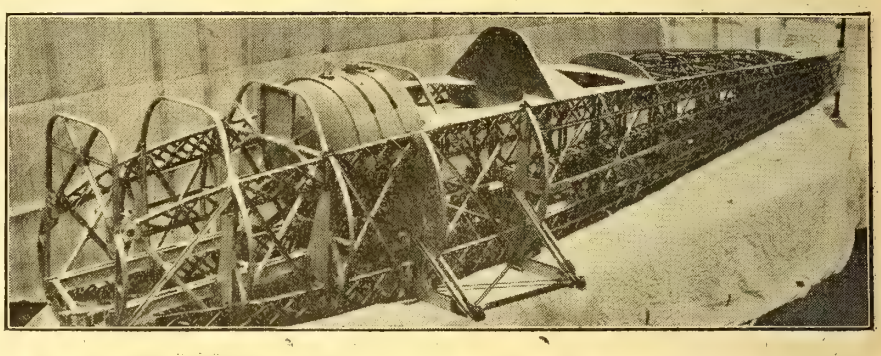
Specification of Westland Six-Seater Limousine.

Weight, fully loaded	5550 lb.	Dihedral	2½ deg.
Surface, planes, ailerons and C section	726 sq. ft.	Area, tail plane	40 sq. ft.
Weight per sq. ft.	7.65 lb.	Area, elevators	30 sq. ft.
Weight per h.p.	12.3 lb.	Area, fin	9.8 sq. ft.
Span, top planes	54 ft.	Area, rudder	15.9 sq. ft.
Span, bottom planes	54 ft.	Area, ailerons (each)	27 sq. ft.
Height overall	12 ft. 6 in.	Area, ailerons (total)	108 sq. ft.
Length overall	33 ft. 6 in.	Engine	450 Napier
Gap	7 ft.	Propeller diameter	2980 mm.
Chord, top plane	7 ft. 3 in.	Petrol capacity	96 gal.
Chord, bottom plane	7 ft. 3 in.	Oil capacity	7½ gal.
Stagger	9 in.	Water	10 gal.
Incidence	2¾ deg.	5 passengers and pilot or mails	1200 lb.

The fuselage itself is of considerable interest, as it is designed in the light of Beardmore airship experience, and is a circular streamline body built of duralumin. The longerons are of girders built up much as those of airships, and are coupled by duralumin tubular struts and duralumin ship bracing pieces. The outer covering is of doped fabric, and this is supported to maintain the circular section by a facing of duralumin stringers.

The planes are of similar structure. Top and bottom wings are of equal span, but the chord of the top plane exceeds that of the bottom one considerably, and there is a heavy forward stagger to the upper one. Two bays of interplane struts are fitted to each side. The struts are faired steel tubes, and the interplane wing is of streamline type throughout.

Folding gear is fitted, allowing the wings to fold alongside the fuselage for stowage. The tail is of conventional type. The most important feature is that all the control wires are within the fuselage, the elevator levers being operated through a long shaft to which the wires attach. The tail-plane is adjustable over a range of 5 degrees, and the machine can be trimmed thereby to any desired flying speed.



The fuselage of the Beardmore W.B.10. The photograph shows how airship type duralumin girders have been used in the construction.

THE BEARDMORE W.B.10.

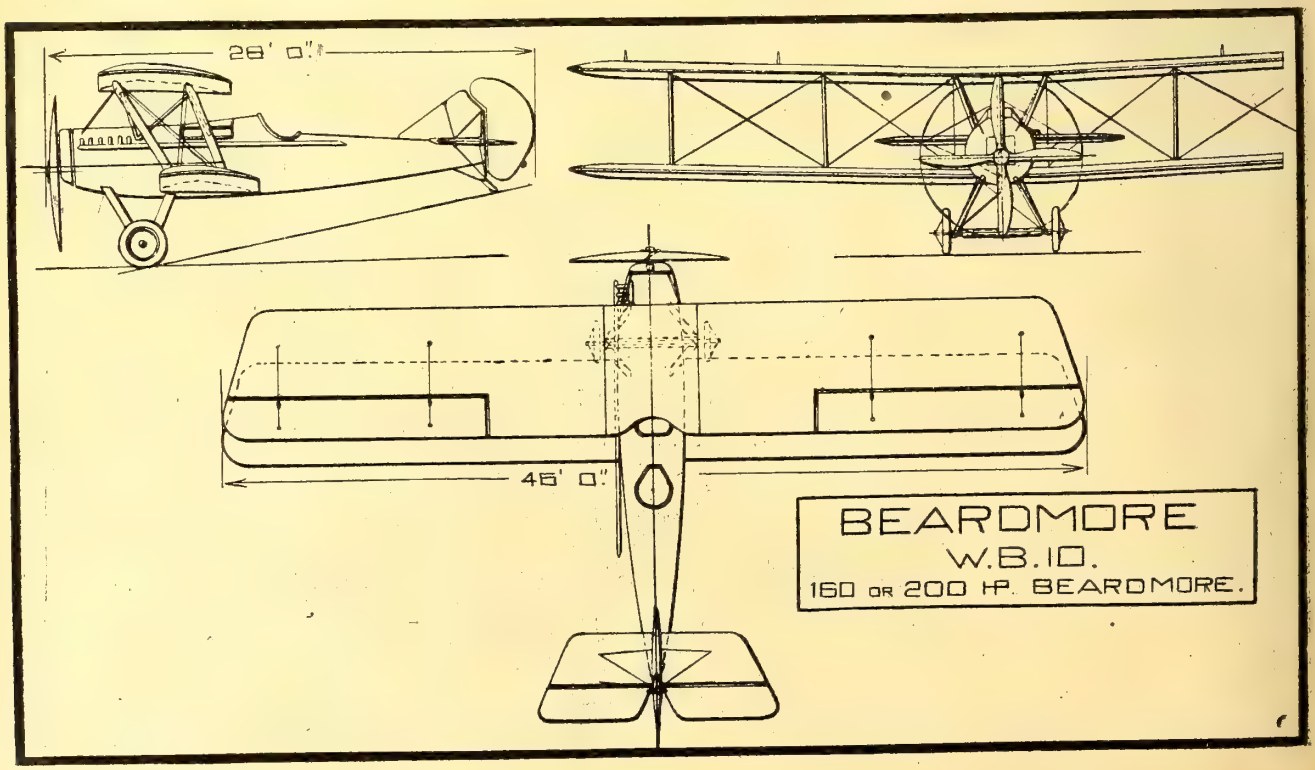
In form the machine is a conventional tractor biplane, of large size—as modern machines go—for a two-seater. This consequent upon the demands of the competition for low-landing speed and a quick get-off.

Comfort on the part of the passenger being one of the chief ends of the competition, the passenger is ensconced in a cockpit which may be opened, or closed by a Triplex glazed roofing at the will of the occupant. This cockpit is very roomy, and despite the fact that it is between the pilot's seat and the engine, appears to give ample leg-room—a quality not often apparent in cockpits so positioned. The pilot sits aft, and well up in the fuselage, and has an excellent view for landing and taking off.

The undercarrige is of the normal Vee type, rubber sprung, fitted with an articulated axle with checkwires to limit its movement. The power plant consists of a six-cylinder Beardmore engine, mounted very accessibly beneath duralumin cowlings, and adequately silenced. A hand starting-gear is fitted, operated from the pilot's seat.

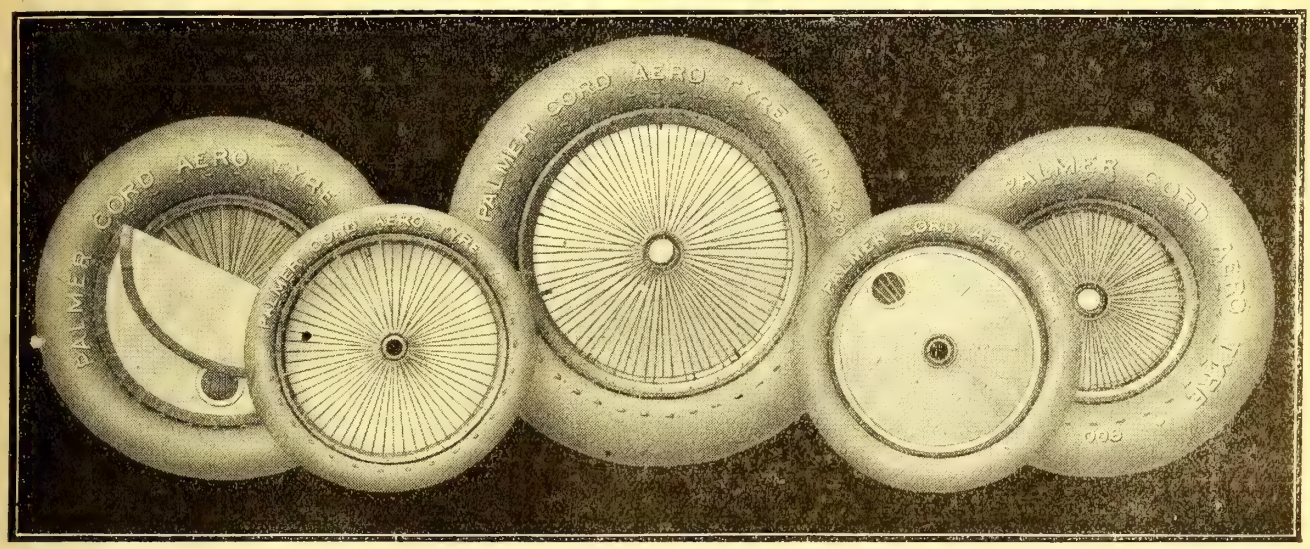
Cooling is provided by a honeycomb radiator in the upper centre section.

A main petrol tank of tinned steel, with a capacity of 68 gallons, is carried in the fuselage, just aft the engine. An air-driven petrol-pump and a hand-pump serve alternatively to feed the gravity tank, fitted in the upper section, which supplies the carburetter. Surplus returns by an overflow to the main tank. All petrol lines are in duplicate, and any damaged



PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Sizes	Wheel No.	Hub. Length	Hub. Bore	Track Line
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30*	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132 46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135 50
,,	*40	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125 60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

**Wheels No. 36 and 40 are of stronger type than the other wheels for 800 x 150 tyres.*

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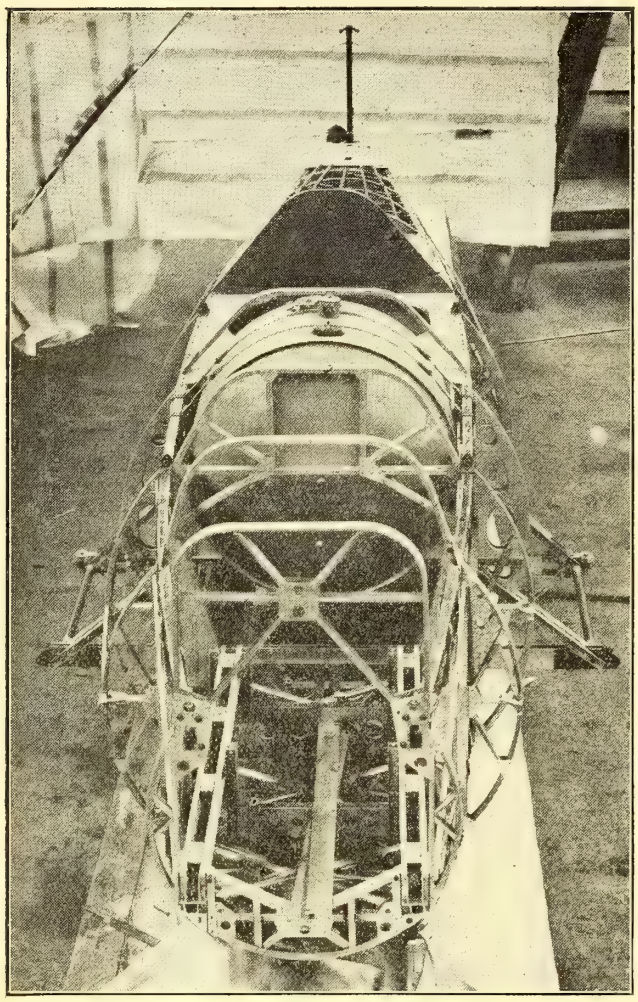


End view of the Beardmore Duralumin Fuselage showing the engine bearer arrangements.

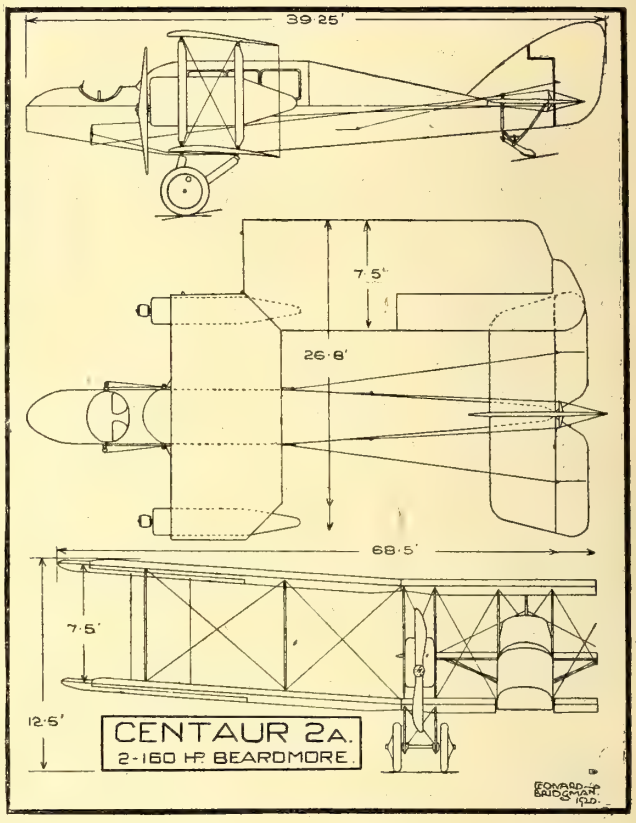
petrol-pipe can be cut out and replaced by an alternative. By whatever route petrol may reach the engine, however, it passes three filters on its way. Incidentally rubber joints in petrol-pipes do not occur on this machine, as braided flexible hose is used throughout in place of rubber. The general dimensions are as follows :—

SPECIFICATION.

Span	46 ft.	Gap	
Span (folded)	19 ft.	Length overall	26 ft.
Chord (top)		Height overall	11 ft. 10 in.
Chord (bottom)		Engine	185-h.p. Beardmore
Weight (empty)	1,852 lb.	Endurance	6 hr.
Weight (full)	2,849 lb.	Speed	91 m.p.h.
Useful load	200 lb.	Climb	10,000 ft. in 27 min.
Fuel capacity	75 gall.		

THE CENTRAL AIRCRAFT CO.'S CENTAUR 2A.

This is a small twin-engined machine seating passengers within a limousine in the central body. Apart from the en-



closing of the passengers it is similar to the machine which has already been described in these pages.

GENERAL SPECIFICATION.

Motor	2/160-h.p. Beardmore	Total weight	5,400 lb.
Tankage	$3\frac{3}{4}$ hrs. full speed $5\frac{1}{2}$ hrs. cruising	Unladen weight	3,160 lb.
Span	63 ft. 10 in.	Useful load	2,240 lb.
Width, with wings folded,	27.6 ft.	Speed range	38.85 m.p.h.
Length	39 ft.	Petrol consumption per hr.	25 gals.
Weight per sq ft.	6.05 lb.	Oil consumption per hr.	2 gals.
Surface	895 sq. ft.	Control	Wheel
Weight per h.p.	16.9 lb.		

A RATIONAL METHOD OF PRESENTING WING TEST RESULTS.

In this country it has always been customary to define the aerodynamic properties of wing sections either by a tabulated statement of the lift coefficient, the drag coefficient, and the lift to drag ratio at various angles, or alternatively to present these quantities in the form of curves plotted against angles with the addition of a curve wherein Lift/drag is plotted against lift coefficient.

From the attitude of the laboratory worker these methods are simple and convenient, and they do actually give to the aeroplane designer the information which he needs as to the characteristics of a wing.

But they do not present this information in the form in which the designer needs it for actual use, neither do they show clearly to the casual observer the essential characteristics of the particular form of aerofoil as a load carrier.

The important features in the characteristics of a wing for aeroplane design are the relations between speed, weight carried, and power expended, and a simple and graphic exposition of these relations is needed to show clearly the possibilities of any given wing. To obtain these relations from the absolute values of lift and drag coefficients calls for a certain amount of computation, and in general this computation requires to be made for every change of wing loading and of total weight for each wing.

It has already been suggested—by Mr. Handley Page, Major A. R. Low, and others—that wing characteristics should be exhibited in the form of speed power curves, but for some reason these suggestions have met with little support.

This is probably because although there have always been good wings and bad wings, the sole difference of importance has lain in the maximum value of the L/D ratio, and there has been relatively little difference between the speed characteristics for equal loading of the good wings.

With the growing interest in high lift wings for commercial load-carrying purposes it seems well worth while to again suggest a more graphic method of depicting the qualities of aerofoil sections.

The method which can be adopted is very simple. Using the standard "absolute" units adopted in this country, if K_L max. is the maximum lift coefficient of any wing section, then for unit landing speed the load per sq. ft. which that wing can carry is

$$l = K_L \text{ max.} \frac{\rho}{g}. \qquad (1)$$

At any less value of the life coefficient and with the same loading l the speed for support is

$$V = \sqrt{\frac{K_L \text{ max.}}{K_{L_V}}} \qquad (2)$$

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At any such speed V the thrust required by the wing to support a total weight W is

$$T = W \left(\frac{L}{D}\right)_V .$$

where $\left(\frac{L}{D}\right)_V$ is the lift to drag ratio corresponding to the speed V, and the power required to supply that thrust is

$$P = T \times V$$

$$= W \left(\frac{L}{D}\right)_V \sqrt{\frac{KL\ max.}{KL_V}} .$$

Taking the total weight W as unity this becomes

$$P = \left(\frac{L}{D}\right)_V \sqrt{\frac{KL\ max.}{KL_V}} . \qquad (3)$$

If, therefore, the usual table of successive values of KL and of $\frac{L}{D}$ is taken successive values of $\sqrt{\frac{KL\ max.}{KL_V}}$ gives a series of values of V in terms of the minimum or landing speed, and that series each multiplied by its corresponding value of $\frac{L}{D}$ gives a measure of the power required to propel that wing at the corresponding speed.

These figures are non-dimensional and can be applied directly to any system of units for design purposes.

Curves have been plotted of P against V for R.A.F.15 and the new "Alula" wing on this basis, and they show very much more clearly the qualities of the two wings than do the usual tables or curves.

There is marked on the curves the values of $\frac{1}{KL\ max.} = s$ which represents the surface needed to support unit load at unit landing speed.

For instance, the curves show that for equal total weight carried and for equal landing speeds the minimum power expended on driving the "Alula" wing is less than that required to drive R.A.F.15 in the ratio $\frac{\cdot 051}{\cdot 084}$.

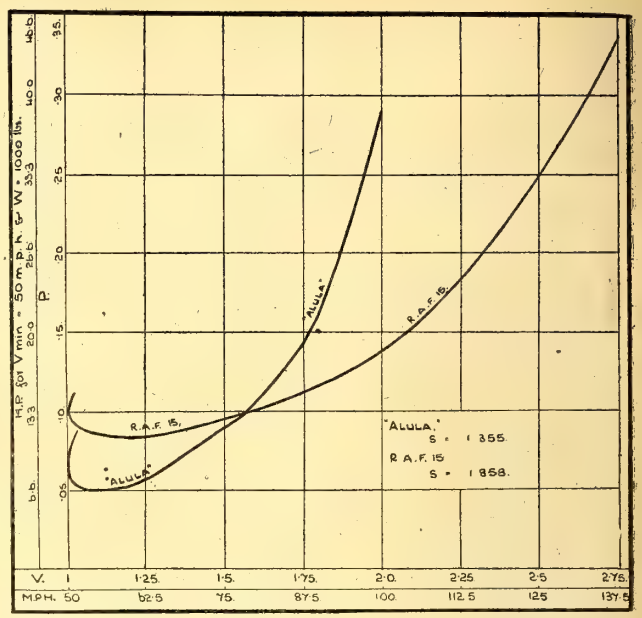
For any speed up to 1.58 times the landing speed the "Alula" wing obviously requires less power than does the R.A.F.15, and for any speed greater than 1.58 times the minimum R.A.F.15 becomes distinctly more economical. The figure "s" given for each of the two wings on the curve is the reciprocal of their maximum lift coefficient and is the surface required to carry unit load at unit landing speed.

The curves can be directly applied to any concrete case by multiplying the scales by appropriate constants.

For instance, for a total weight of A lb. and a fixed landing speed of B miles per hour, the speed scale must be multiplied by B. Then 1 on the power scale will represent A × B mile-pounds per hour or 0.0026 A.B. h.p.

The surface required can then be computed from the value of "s" given from

$$S = 196{\cdot}08 \frac{A}{B^2} . s.$$



Speed power curves of R.A.F.15 and the "Alula" wing.

If on the other hand a definite loading is fixed, say a lb. per sq. ft., then the landing speed B in m.p.h. is given by

$$B = V\ min. = \sqrt{\frac{196{\cdot}08\ a}{KL\ max.}} = \sqrt{196{\cdot}08 \times a \times s}.$$

The surface is obviously $\frac{A}{a}$ and the h.p. value of the P scale is obtained exactly as before, using the value of B above.

If the weight is A kg., and the landing speed B metres a second, the power scale is multiplied by AB to give power in kg.m. per sec. or by $\frac{AB}{75}$ to give h.p. The surface required in sq. m. becomes

$$S = 8 \frac{A}{B_2} s.$$

For any one wing only one such curve needs to be computed. For all such curves a series of standard scales for convenient landing speeds and for actual h.p. required for a convenient weight unit—1,000 lb., or 1 ton—can be made out once and for all.

In the example a scale for 1,000 lb. weight and 50 m.p.h. has been added.

This will do away with the need for much of the tiresome routine work involved in the preliminary work of choosing a wing section and the corresponding surface for any given requirements.

THE NIEUPORT AND GENERAL AIRCRAFT CO., LTD.

It is now announced to the public at large that the Nieuport and General Aircraft Co., Ltd., are to close their works at Cricklewood and to retire from the business of making aircraft, at least for the present.

That the British Aircraft Industry should, in the present state of affairs, lose the support of those of its wartime adherents who lacked enthusiasm and unbounded confidence in the future of aviation, was inevitable, that a firm of such high technical achievements as the Nieuport Company should be among its number is regrettable, since the existence as a working and organised unit of the technical staff of such a concern is thereby ended to the loss of the nation as a whole.

A particularly melancholy interest therefore attaches to the following short description of the last of the products of the said staff, the holder of the British speed record.

It is to be hoped that Mr. Folland, the designer thereof, will very shortly find opportunities for carrying on his work as improver of the breed of aeroplanes under more permanent conditions.

THE NIEUPORT "GOSHAWK."

Generally speaking, the machine is a single "I" strut biplane with a monocoque fuselage and a 320 h.p. A.B.C. "Dragonfly" engine with a modified induction system and three carburetters.

The construction of the fuselage is uncommon, in that the fore half is built up in the usual way with four longerons and formers giving it a circular section to preserve the form of the nose. From about two feet in the rear of the pilot's seat the fuselage changes to monocoque construction, the extreme point being finished with a metal cone, the rudder being cut away to clear it. The main petrol and oil tanks are carried inside the fuselage, and in addition a gravity tank is fitted in the plane.

The empennage is similar to that of the "Nighthawk" in appearance, a large fin being placed above and a small one below the fuselage. The rudder is balanced, and is actuated by control "bloaters" carried inside the fuselage. The elevators are hinged to the tail-plane by steel bands passing round tubes in the trailing edge of the tail plane and the leading edge of the elevators, the intervening gap being covered by a metal strip on the upper side which obviates any air disturbance. The elevators are operated inside the fuselage by "bloaters" carried in the continuous tube in which the elevators are mounted. A sprung tail skid is carried in the rudder. The tail plane is very carefully blended into the fuselage, this giving the minimum of resistance.

The main planes, of 20 ft. 6 in. span and 3 ft. 10 in. chord, are unstaggered and have ailerons on the bottom plane only. The two wing and the two centre section struts are of the "I" type and are attached to the planes by a solid walnut compression rib running between the two spars. This rib is pierced in three places and three metal tongues are passed through. On either side, and corresponding to the three

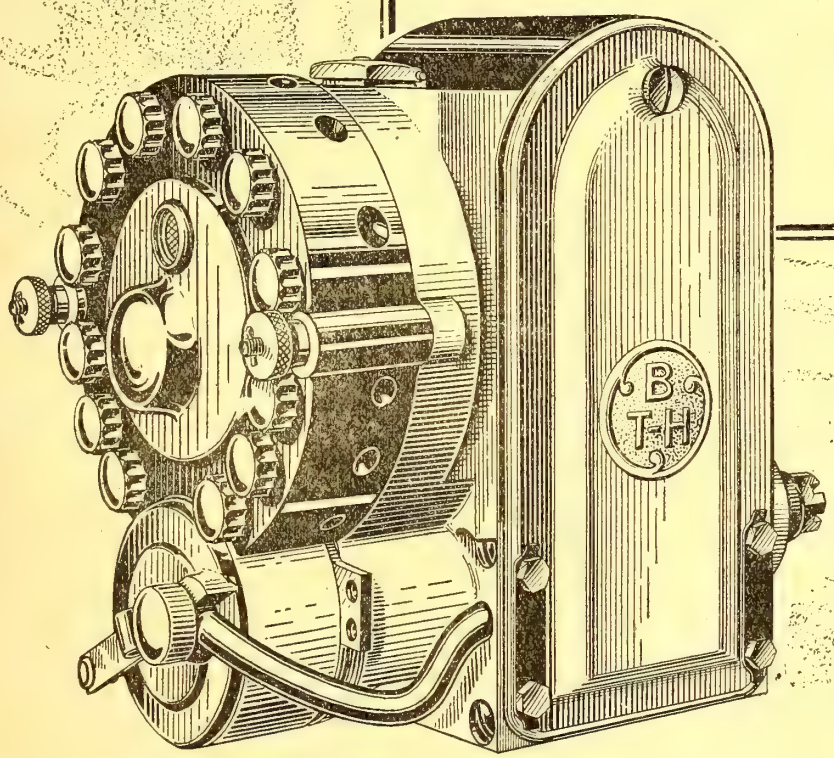
Hendon Aerial Derby.

B.T.H. Magnetos

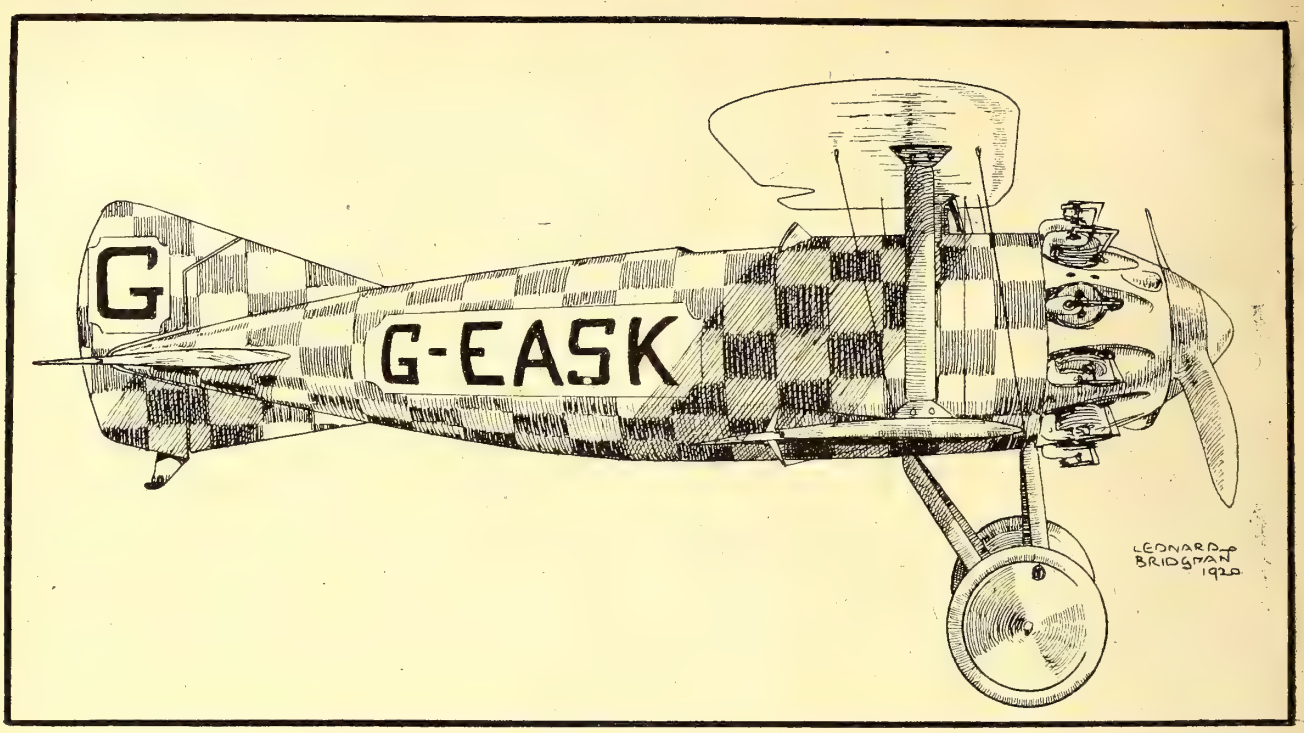
were fitted to the engines of the aeroplanes that secured first and second places in the Aerial Derby held at Hendon on Saturday, July 24th.

They were also used on the aeroplanes which secured the first and second places in the 1919 Aerial Derby.

The British Thomson-Houston Co., Ltd.,
Lower Ford Street, Coventry, England.
Member of the British Ignition Apparatus Association.



B T-H



The Nieuport "Goshawk."

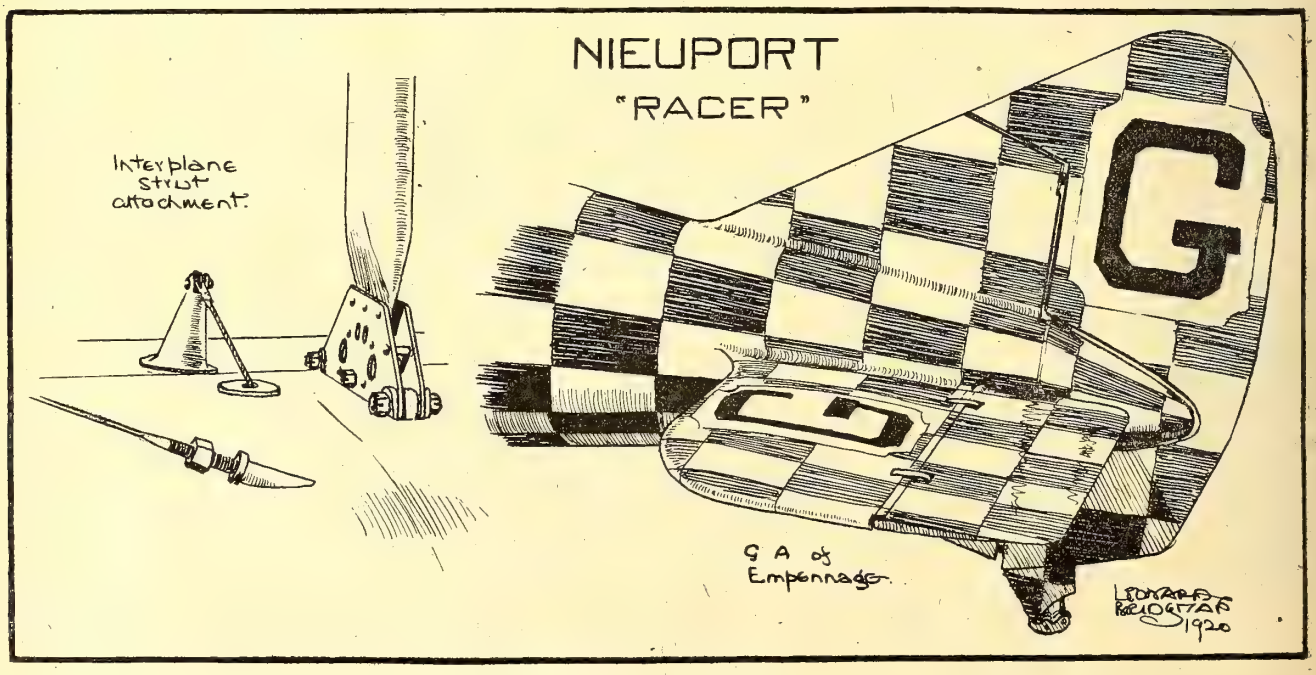
central tongues, are three metal plates which are bent to the shape of half the spar. In between the central tongues and the outside plates are bolted on the upper and lower sides of the bottom and top planes respectively, two triangular plates, in between which are bolted the streamline section single struts.

The aileron control is of normal type and the short length of cable from the control "bloaters" to the point where it enters the plane just in advance of the rear spar, represents the only external control of the machine. The undercarriage as actually fitted to the machine is normal, but for the maximum speed possible two specially built tandem wheel sets can replace the ordinary wheels. These tandem wheels are of small size and mounted on a frame which is free to move longitudinally on the axle. Each pair of wheels is semi-enclosed in a streamline metal casing. Two single flying wires and a landing wire of streamline section are fitted on each side. The 320 h.p. "Dragonfly" is bolted directly to the engine bearer plate, and is enclosed in a metal cowl carefully streamlined so as to afford the necessary cooling to the cylinders. The propeller is built up with a huge spinner, which preserves the contour of the machine. The workmanship of the whole machine is beautifully carried out and is deserving of the highest praise.

AVIATION CLOTHING.

Samuel Brothers, Ltd., of Ludgate Hill and Oxford Street, the well-known tailors, who were one of the few enterprising firms to display aviation clothing at the recent Aero Show at Olympia, are now prepared to offer any kind of leather or waterproof clothing at a very low price. They are, of course, the makers of the well-known "Aquascutum" waterproof material. To show how really effectually waterproof this really is, drop after drop of water is allowed to fall in the same spot from a height, and, on inspection, the reverse side is seen to be quite dry.

The firm also specialise in uniforms, and, again, owing to the very moderate price charged, a visit from officers returning to the Air Force who have either disposed of their uniform or only had the old khaki pattern will be found well worth while.—G. D.



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OFFICIAL NOTICES.

NOTICE TO AIRMEN, No. 86

It is hereby notified: Additions and amendments to Notice to Airmen No. 81 (Consolidated list of Aerodromes) of July 20th are as follows:—

LIST B (a).

PERMANENT SERVICE STATIONS.

Scopwith.—The name should be altered to *Digby*.

LIST B (b).

Stations temporarily retained for Service purposes.

The particulars regarding the following aerodromes should be amended to read as follows:—

	Lat. deg.	Lat. m.	Lat. s.	Long. deg.	Long. m.	Long. s
Barrow (Walney) A	54	7	0N	3	15	30W
Inchinnan	55	53	0N	4	26	30W

LIST C (b).

LICENSED CIVIL AERODROMES.

Civil Aerodromes licensed as "Suitable for Avro 504K and similar types of aircraft only."

Except in very few instances accommodation does not exist. The licences have also been issued for limited periods only.

Foreshore aerodromes are not included

The following aerodromes are published as additions:—

AERODROMES. Name.	Lat. deg.	Lat. m.	Lat. s.	Long. deg.	Long. m.	Long. s.	Ht. above sea level. ft.	NEAREST RAILWAY STATION.	NEAREST TOWN. Name.	Dist. from Aerod'e miles.	True bearing from Aerod'e
Lincoln	53	13	40N	0	30	0W	20	Lincoln (G.C.R. & G.N.R.) 1½ miles	Lincoln	1½	W
Scarborough	54	30	0N	0	24	0W	400	Scarborough (N.E.R.) 1¼ miles	Scarborough	1	N.
Gt. Yarmouth	52	35	0N	1	44	0E	20	Gt. Yarmouth (G.E.R.) 2 miles	Gt. Yarmouth	1	N.
Pinhoe, Exeter	50	44	20N	3	28	30W	300	Pinhoe (L. & S.W.R.) ½ mile, Exeter (L. & S.W.R. & G.W.R.) 3½ miles	Exeter	3½	W.S.W.

The particulars regarding the following aerodrome should be amended to read as follows:—

Blythe Bridge, Longton	52	57	30N	2	4	30W	610	Blythe Bridge (N. Staffs Rly.) 1 mile	Longton	3½	N.W.

August 13th, 1920.

Air Ministry (C. of I.),
London, W.C.2.

By Command of the Air Council,
W. F. NICHOLSON.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail.	No. of Passengers.	Pilot.
August 9th	A.T. & T.	DH16	G-EALM	London	Paris	09 30	11.55	Gds&M.	4	Lines
	A.T. & T.	DH16	G-EAPT	London	Amsterdam	10 35	13.04	Goods	Nil	Reeve
	M.A.	Breguet	F-CMAC	London	Paris	11.55	14 30	Goods	Nil	Le Men
	I.A.L.	"Vimy"	G-EASI	London	Paris	13.00	15.45	Nil	5	Chattaway
	A.T. & T.	DH9	G-EAGY	London	St. Inglevert	14.22	—	Nil	2	Tebbitt
	A.T. & T.	DH16	G-EAPM	London	Paris	16.40	18.50	Gds&M.	2	Robbins
	A.T. & T.	DH16	G-EASW	Paris	London	09.45	12.20	Goods	3	Game
	C. des G.E.A.	Goliath	F-GEAC	Paris	London	10.10	16.25	Goods	3	Favrant
	C.T.	Nieuport	F-ICGT	Paris	London	12.30	15.30	Mail	Nil	Le Comte
	A.T. & T.	DH9	G-EAQN	Berck	London	—	14.10	Nil	Nil	Forson
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	15.00	18.30	Gds&M.	Nil	Milnes
	A.T. & T.	DH16	G-EALM	Paris	London	16.30	19.15	Nil	2	Lines
	A.T. & T.	DH18	G-EARI	Paris	London	16.35	19.10	Nil	6	Armstrong
	A.T. & T.	DH9	G-EAGY	St. Inglevert	London	18.35	20.45	Nil	2	Tebbitt
August 10th	A.T. & T.	DH16	G-EASW	London	Paris	09 30	12.35	Gds&M.	4	Holmes
	C.T.	Nieuport	F-ICGT	London	Paris	09.53	12.10	Nil	Nil	Le Comte
	A.T. & T.	DH9	G-EAQN	London	Amsterdam	10.07	12 55	Goods	Nil	Bradley
	A.T. & T.	DH16	G-EALM	London	Paris	16 48	18.45	Gds&M.	3	Game
	A.T. & T.	DH16	G-EAPM	Paris	London	10.20	12.52	Goods	3	Robbins
	I.A.L.	"Vimy"	G-EASI	Paris	London	12.45	15.45	Goods	3	Chattaway
	M.A	Breguet	F-FYMS	Paris	London	12 30	15.45	Gds& M	Nil	Challaux
	A.T. & T.	DH16	G-EAPT	Amsterdam	London	15.25	18.30	Gds& M.	Nil	Reeve
	A.T. & T.	DH16	G-EASW	Paris	London	16.40	19.35	Gds& M.	3	Holmes
	M.A	Breguet	F-CMAF	Paris	London	16.55	19.35	Nil	2	Martel
August 11th	A.T. & T.	DH16	G-EASW	London	Paris	12.40	15.10	Nil	4	Armstrong
	A.T. & T	DH9	G-EAPL	London	Paris	12.45	15.10	Goods	1	Bamber
	A.T. & T.	DH16	G-EAPT	London	Amsterdam	13.04	16 02	Goods	Nil	Forson
	C. des G.E.A.	Goliath	F-GEAC	London	Paris	14 15	17.35	Nil	Nil	Favrant
	M.A.	Breguet	F-FYMS	London	Paris	14.30	17.15	Nil	Nil	Challaux
	M.A.	Breguet	F-CMAF	London	Paris	14.35	17.00	Nil	Nil	Martel
	A.T. & T.	DH16	G-EALM	London	Paris	16.40	19.05	Nil	4	Lines
	A.T. & T.	DH9	G-EAGY	London	Paris	17.15	19.40	Goods	1	Milnes
	C. des G.E.A.	Goliath	F-HMFU	Paris	London	10.45	18.15	Goods	Nil	Patin
	A.T. & T.	DH16	G-EALM	Paris	London	10 10	12.15	Gds&M.	2	Game
	A.T. & T.	DH9	G-EAQN	Amsterdam	London	15.11	17.45	Mail	Nil	Bradley
	A.T. & T	DH16	G-EASW	Paris	London	17.10	19.35	Nil	1	Armstrong

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs M = Mail.	No of Passengers.	Pilot.
August 12th	A T. & T.	DH16	G-EAPM	London	Paris	10.00	12.35	Gds&M.	1	Robbins
	A.T. & T.	DH9	G-EAQN	London	Amsterdam	10.06	13.28	Goods	Nil	Tebbitt
	I A.L.	"Vimy"	G-EASI	London	Paris	14.10	18.30	Nil	Nil	Chattaway
	A.T. & T.	DH16	G-EASW	London	Paris	18.00	20.20	Gds &M.	Nil	Reeve
	A.T. & T.	DH16	G-EALM	Paris	London	—	12.00	Nil	3	Lines
	A.T. & T.	DH9	G EAPL	Paris	London	09.55	12.10	Nil	2	Milnes
	M.A.	Spad	F-CMAV	Paris	London	13.00	15.04	Mail	1	Bourdon
	A.T. & T.	DH9	G-EAGY	Paris	London	14.30	17.45	Goods	Nil	Bamber
	A.T. & T.	DH16	G-EAPT	Amsterdam	London	15.33	17 40	Mail	1	Forson
	A.T. & T.	DH16	G-EAPM	Paris	London	17.00	19.05	Nil	1	Robbins
August 13th	A.T. & T.	DH16	G-EAPT	London	Paris	09.30	12.00	Gds &M	3	Holmes
	A.T. & T.	DH9	G-EAGY	London	Paris	09.50	12 00	Goods	1	Shaw
	A.T. & T.	DH16	G-EAPM	London	Amsterdam	09.55	13.05	Goods	Nil	Game
	C. des G.E.A.	"Goliath"	F-HMFU	London	Paris	11.52	Landed Bigginh	Goods	Nil	Patin
	A.T. & T.	DH16	G-EALM	London	Paris	16.47	19.20	Gds&M.	4	Lines
	A.T. & T.	DH9	G-EAPL	Lo don	Paris	16 50	19.15	Nil	2	Carter
	A.T. & T.	DH16	G-EASW	Paris	London	09.55	12.15	Nil	4	Reeve
	C. des G.E.A.	"Goliath"	F-GEAC	Paris	London	11.20	14.00	Goods	3	Labouchère
	C.T.	Nieuport	F-ICGT	Paris	London	12.55	15.45	Mail	Nil	Hanin
	A.T. & T.	DH9	G-EAQN	Amsterdam	London	15.10	17.20	Gds&M	Nil	Tebbitt
	A.T & T.	DH16	G-EAPT	Paris	London	16.45	19 00	Nil	4	Holmes
August 14th	A.T. & T.	DH9	G-EAOZ	London	Paris	11 07	13.45	Gds&M.	1	Milnes
	A.T. & T.	DH16	G-EASW	London	Amsterdam	11 14	14.53	Goods	Nil	Bradley
	C.T.	Nieuport	F-ICGT	London	Paris	12.00	12.00	Nil	Nil	Hanin
	A.T. & T.	DH18	G-EAUF	London	Paris	14.27	15th 16 36	Goods	5	Forson
	A.T. & T.	DH9	G-EAQN	London	Paris	16.40	18 55	Gds&M	Nil	Bamber
	A.T. & T.	DH9	G-EAPL	Paris	London	09.50	12.15	Nil	2	Shaw
	A.T. & T.	DH16	G-EALM	Paris	London	10 00	12 37	Goods	2	Milnes
	M.A.	Breguet	F-CMAF	Paris	London	12.40	15.30	Gds&M.	Nil	Le Men
	A.T. & T.	DH16	G-EAPM	Amsterdam	London	15.07	17.20	Mail	Nil	Game
	A.T. & T.	DH9	G-EAGY	Paris	London	16.25	19 10	Nil	2	Carter
	A.T. & T.	DH9	G-EAOZ	Paris	London	16.30	19.30	Nil	2	Milnes
August 15th	A.T. & T.	DH16	G-EALM	London	Paris	10.00	12 10	Nil	2	Robbins
	M A.	Spad	F-CMAV	London	Paris	11.30	15 40	Nil	Nil	Bourdon
	C. des G.E.A.	"Goliath"	F-GEAC	London	Paris	12.15	16.10	Nil	Nil	Labouchère
	A.T. & T.	DH18	G-EAUF	Paris	London	10.25	13.00	Goods	5	Forson
	I.A.L.	"Vimy"	G-EASI	Paris	London	12.00	15 10	Nil	Nil	Chattaway

The Air Port of Cricklewood.

(Compiled from Log of Cricklewood Aerodrome. Continental times from Air Ministry communiqué and tape machine)

August 9th	H.P.T.	DH9	H-9274	London	Copenhagen	12.00	—	Nil	1	Fowler
	H.P.T.	Hand'y Page	G-EASY	London	Paris	12.05	15.15	Goods	7	Wilcockson & 1
	H.P.T.	Hand'y Page	G-EASL	London	Brussels	14.40	17.00	Gds&M.	5	Rogers & 1
	H.P.T.	DH9	G-EAUI	Amsterdam	London	14 05	16.10	Gds&M.	2	Perry
	H.P.T.	Hand'y Page	G-EATM	Paris	London	12.00	16.15	Nil	8	Bager & 1
	H.P.T.	DH9	G-EAUH	London	Amsterdam	16.20	19.15	Gds&M.	Nil	Hope
	H.P.T.	Hand'y Page	G-EATH	Paris	London	12.05	16.20	Goods	4	Beal & 1
	H.P.T.	DH9	G-EAUQ	Brussels	London	16 05	18.15	Mail	Nil	Jones
August 10th	H.P.T.	DH4	O2 (5925)	London	Brussels	12.07	14.20	Nil	Nil	Perry
	H.P.T.	Hand'y Page	G-EATK	London	Paris	12.15	15 30	Goods	5	Olley & 1
	H.P.T.	DH9	G-EAUI	London	Brussels	14.35	16.45	Gds&M.	Nil	Hill
	H.P.T.	DH9	G-EAUQ	London	Amsterdam	16.20	19.20	Gds&M	Nil	Capps
	H.P.T.	DH9	G-EAUH	Amsterdam	London	14 20	17.40	Gds&M.	Nil	Hope & 1
	H.P.T.	Hand'y Page	G-EASL	Brussels	London	15.10	19 30	Mail	5	Rogers & 1
August 11th	H.P.T.	Hand'y Page	G-EATM	London	Paris	12.00	15.10	Goods	8	Bager & 1
	H.P.T.	DH4	O3	London	Brussels	11.15	13.35	Goods	Nil	Rogers
	H.P.T.	DH4	O4	London	Brussels	11.25	13.45	Mail	1	Hope
	H.P.T.	DH9	G-EAUQ	Amsterdam	London	11.15	14.20	Mail	1	Capps
	H.P.T.	DH9	G-EATA	London	Brussels	14.45	17.05	Mail	Nil	Jones
	H.P.T.	Hand'y Page	G-EATG	Paris	London	12.30	15.45	Nil	7	Olley & 1
	H.P.T.	Hand'y Page	G-EASY	Paris	London	12.20	15.45	Goods	5	Wilcockson & 1
	H.P.T.	DH9	G-EAUH	London	Amsterdam	16.05	19.00	Mail	Nil	Perry
	H.P.T.	DH9	G-EAUI	Brussels	London	17.50	19.55	Mail	2 (extra pilots)	Hill
August 12th	H.P.T.	Hand'y Page	G-EATU	London	Paris	12.20	16 10	Goods	4	Beal & 1
	H.P.T.	DH9	G-EAUH	Amsterdam	London	11.00	13.55	Mail	1	Perry
	H.P.T.	DH9	G-EAUQ	London	Brussels	14.35	17.05	Mail	2	Wilcoxson
	H.P.T.	DH9	G-EAUI	London	Amsterdam	16.15	19.04	Gds&M.	2	Olley
	H.P.T.	Hand'y Page	G-EATN	Paris	London	12 45	15.45	Gds&M.	3	Bager
	H.P.T.	DH4	O5	London	Brussels	15.55	18.10	Nil	Nil	Rogers
	H.P.T.	DH9	G-EAUO	Amsterdam	London	13.05	16 45	Nil	Nil	Moore
	H.P.T.	DH9	G-EATA	Brussels	London	15.10	17.20	Goods		Jones
August 13th	H.P.T.	DH9	G-EAUI	Amsterdam	London	11.40	14.10	Mail	—	Olley
	H.P.T.	Hand'y Page	G-EASZ	London	Brussels	15 15	19.10	Mail	4	Hope & 1
	H.P.T.	DH9	G-EAUH	London	Paris	14 55	17.40	Nil	1	Jones
	H.P.T.	DH9	G-EAUO	London	Amsterdam	16.15	19.20	Mail	Nil	Perry
	H.P.T.	Hand'y Page	G-EATK	Paris	London	12.45	16.00	Goods	4	McIntosh & 1
	H.P.T.	Hand'y Page	G-EATJ	Paris	London	13.40	16.50	Nil	5	Beal
	H.P.T.	DH9	G-EAUQ	Brussels	London	15.00	17.05	Mail	1	Wilcockson
August 14th	H.P.T.	DH4	O14	London	Brussels	11.55	14.10	Nil	Nil	Olley
	H.P.T.	Hand'y Page	G-EATN	London	Paris	12.05	15.50	Nil	10	McIntosh
	H.P.T.	Hand'y Page	G-EASY	London	Paris	12.30	15.30	Goods	6	Bager & 1

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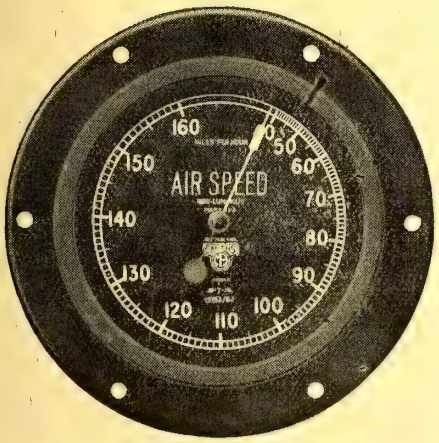

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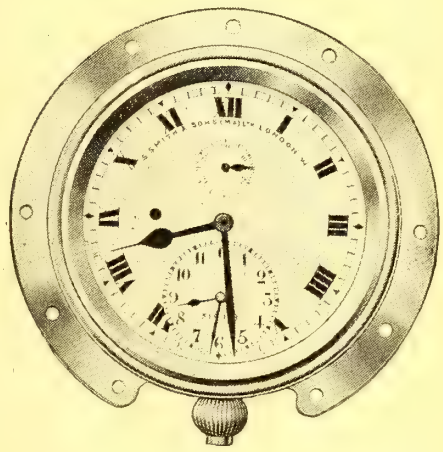

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Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No. of Passengers.	Pilot
August 14th	H.P.T.	DH9	G-EAUC	London	Brussels	14.35	16.50	Gds&M.	2	Capps
	H.P.T.	DH9	G-EAUH	Paris	London	12.45	15.37	Nil	1	Jones
	H.P.T.	DH9	G-EAUQ	London	Amsterdam	16.10	19.25	Gds&M.	1	Rogers
	H.P.T.	Hand'y Page	G-EASZ	Brussels	London	15.10	19.40	Mail	2	Hope & 1
August 15th	H.P.T.	Bristol	G-EASH	London	Brussels	11.50	13.45	Nil	1	Hill
	H.P.T.	Hand'y Page	G-EASN	London	Paris	12.12	15.05	Goods	3	Beal & 1
	H.P.T.	Avro	G-EAVO	London	Brussels	12.15	—	Nil	Nil	Fowler
	H.P.T.	Hand'y Page	G-EASY	Paris	London	12.00	15.50	Nil	10	Bager
	H.P.T.	DH9	H-9272	London	Copenhagen	16.40	—	Nil	1	Faber

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.

Where times are missing it is probably owing to Atmospherics affecting signals. "1" denotes an extra mechanic.

Inland Arrivals and Departures.

FROM AUG. 9TH TO 15TH, 1920.

Aug. 9th.—A.T.T., 1 D.H.16, test; 1 D.H.18, test.

Aug. 10th.—A.T.T., 1 D.H.9, test; M.W.T. Co., 1 D.H.6, wireless test.

Aug. 11th.—A.T.T., 1 D.H.9, test; P.L., Westland, from Yeovil, 1 joy-ride (this machine is ready for "The Air Post of Banks, Ltd.," but is not yet being run by this company).

Aug. 12th.—A.T.T., 1 D.H.9, 2 joy-rides; 1 Avro, test; P.L., Westland, to Yeovil.

Aug. 13.—A.T.T., Ltd., 1 D.H.9, 1 test; C. des G.E.A., 1 Goliath, from Biggin Hill.

Aug. 14th.—A.T.T., 1 D.H.18, 1 test; 1 Avro, 2 joy-rides.

Aug. 15th.—A.T.T., 1 D.H.9, 1 joy-ride; I.A.L., 1 Vimy, joy-riding.

Inland Flying at Cricklewood.

Aug. 11th.—D.H.9, G-EAUH, local test; D.H.9, G-EAUQ, local test.

Aug. 12th.—D.H.4, 2 joy-rides; D.H.4, 1 test; D.H.9, 1 test; B.E.2e, from Northolt, return.

Aug. 13th.—D.H.9, to Sherburn with 2 passengers, and return; D.H.9, start for Paris but returned and started later; two D.H.9s and 1 Avro from Hendon; D.H.9 test; Avro, 1 joy-ride.

Aug. 14th.—Handley Page, Bristol, D.H.9, 1 test each.

Aug. 15th.—Two D.H.9s, 1 test each.

The London Terminal Aerodrome.

Chief excitement during the week has centred upon the unceasing vigil of the ubiquitous "cinema man" for Mlle. Boland, who has had numerous shots at flying to Croydon in order to be the first woman to fly the Channel. Even if she succeeds in flying in the right direction long enough for her to reach the English coast, she will not have established the record claimed for her by the daily Press. The Channel was crossed by a female specimen of the *genus* "pilot" before the war. The late Miss Harriet Quimby in a Blériot monoplane flew from England to France then.

An A.T. and T. Avro put up a remarkably good performance with an engine temporarily out of condition on Saturday afternoon. It is lucky that the corn has been cut as far as the tram lines. Mr. Game on a D.H.16 made rather a fast landing which carried him on to the stubble that afternoon.

An enterprising photographer is now in attendance at the Aerodrome for the purpose of taking passengers' photographs before or after a flight.

A Westland limousine for the somewhat elusive "Air Post of Banks" appeared during the week from Yeovil.—G. D.

The Instone Air Line.

The "Vimy" had the misfortune to break a tail-skid on Friday at Le Bourget. She returned complete on Sunday.

Many people have been asking how it is that the "Vimy" is always able to be kept in such fine tune with the small staff of mechanics which the line at present employs. The reason is, of course, that only ex-Service mechanics are employed, and these are not afraid of working late hours.

One would particularly like to mention Mr. S. Hayter, chief rigger, and Mr. S. Oldfield, chief mechanic. Also their assistants, Messrs. S. Field, S. G. Hudson, and S. Green. Incidentally it will be seen that, in deference to the name of the firm, all chose the initial "S" for their Christian names.

There is a big difference between the work of these ex-Service men and that of some non-Service men who tell pilots to their faces that they "have the wind up" and are not worth their job because they complain that a machine is not airworthy. One came across a case recently of mechanics who were most indignant because a pilot refused to fly when there was about nine inches play in a joy-stick! That sort of thing is not likely to occur on the I.A.L., and, when they increase their staff, as they will shortly, they have got some excellent material to put in charge of their personnel.

Those who have been wondering about the future policy of the I.A.L. should watch this firm carefully and they will shortly get the surprise of their young lives.—G. D.

Nomenclature.

The very dignified Vickers "Vimy," belonging to the Instone Air Line, which is surnamed "City of London," must have turned the same colour as its window-curtains and gone into a flat spin on reading the *Times* on Aug. 17th. In that paper it was stated that the Instone Air Liner "Little Jimmy" had started for Paris with 13 passengers

One presumes that the reporter had stated over the 'phone that the "Vickers-Vimy" had started, pronouncing "Vimy" as "Vimmy," and the man the other end, being bright, unintelligent and deaf, repeated this as "Little Jimmy."

The I.A.L. will have a lot to live down now!!—G. D.

Mishap to a D.H.18.

On Monday, Aug. 16th, as Mr. Cyril Holmes was starting to Paris on D.H.18 G-EARI, with six passengers and goods, the engine lost "revs." just as the machine was leaving the ground, and the pilot was forced to put her down where he could. He went into the back gardens of some houses in Wallington. One wing hit a tree and the machine was fairly completely deleted. In spite of this, the cabin was undamaged, and the passengers all emerged unhurt through the two manholes on the top, one occupant, aged 61, merely remarking that it was a short trip but a merry one.

The accident proves the strength and general excellence of arrangement of the cabin on the D.H.18. One learns that the houses were more or less an isolated group, but this only shows Mr. Holmes' good sense in not turning away with a heavily loaded machine. One believes this was his first effort on the D.H.18 with a full load.

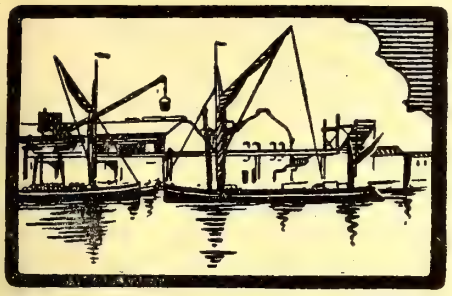
He is a very experienced and steady pilot and has been keenly interested in flying since the very early days, and everyone will sympathise with him in the unwelcome publicity given him owing to the misfortune of crashing with the man who is still married to Mary Pickford in some States. How sorry that lady must be that domestic habits may have deprived her of a wonderful hairbreadth escape news story.

The most likely cause of the accident seems to be that the ignition was not sufficiently far advanced when starting. One does not know whether Mr. Holmes has flown the Napier-engined D.H.16s (usually fitted with Rolls-Royces), or whether this is his first experience with the Napier. But one would suggest that if he had not flown with that engine before on a fully-loaded D.H.18, it was a risk, perhaps justified by circumstances and by his skill as a pilot, to send him up with passengers on a machine which he had not previously flown with a full load.

Anyhow once more one sees a practical demonstration of how safe it is to have quite a bad crash in a well-constructed machine.—G. D.

A Scottish Aerial Derby.

It is expected that within the next two months the people in Edinburgh, Glasgow and Stirling will witness a Scottish Aerial Derby, the arrangements for which are now being completed. The route proposed is from Turnhouse aerodrome, circling Renfrew aerodrome, round Stirling, and back by way of the Forth to Turnhouse—a distance of about 100 miles. The race should last about one hour. There should be a sufficiency of entries, as there are several aviation firms in Scotland who will probably enter machines, and in addition I am informed that several ex-flying officers will also enter. Several prominent men in the district are to be approached with the view of obtaining prizes, and it is probable that the Corporations of the three districts mentioned will provide handsome trophies. As we in Scotland cannot have an Air Show, it has been determined that an Aerial Derby is the best way of promoting the interest of the people in aviation. It will afterwards remain with aviation firms in Scotland to see that this interest is maintained. We certainly have the satisfaction of knowing that the entries will be purely Scottish and that the prizes will remain in the country. The route is certainly a difficult one, and one that will test the pilots severely. The system of handicapping will be the same as in the London race.—MAC.



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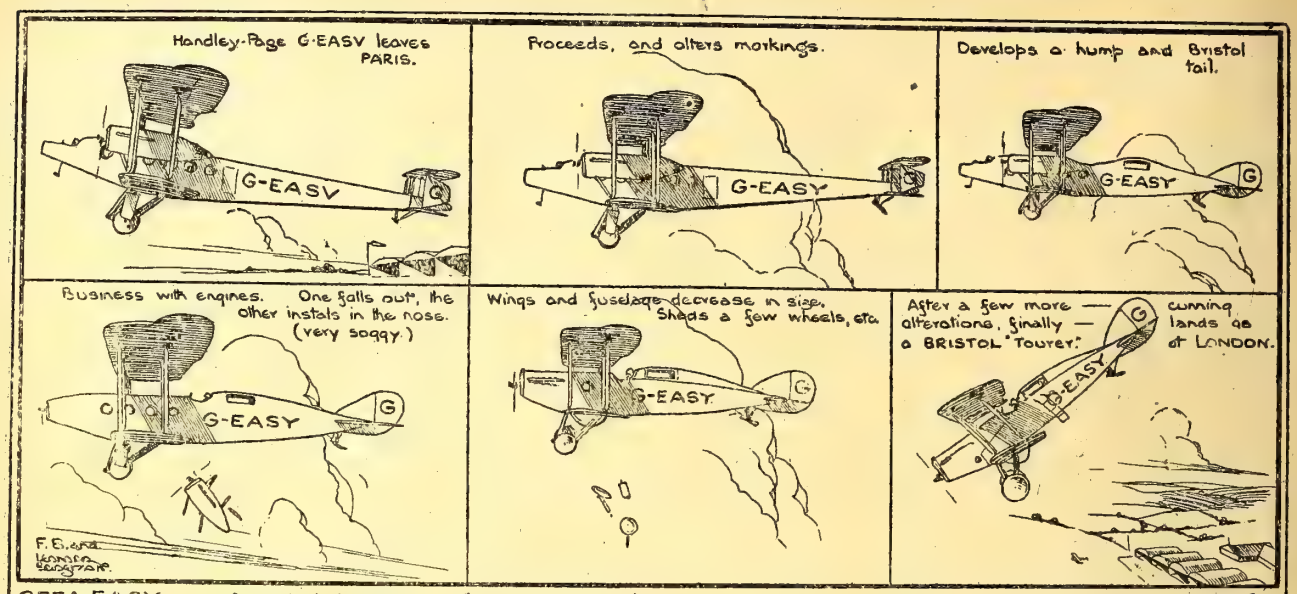

GEE! EASY. An effort to confirm the statements that, at times, are made in the communications sent out by the Department of Information, Department of Civil Aviation, AIR MINISTRY, regarding Aircraft Arrivals and Departures. As shown above, it was reported that on the 7th of JULY, Handley-Page G-EASV left Paris for Cricklewood at 1030 where it arrived at 1650, having in the meantime altered its lettering to G-EASY, and turned itself into a Bristol.

Bournemouth.

As stated in last week's AEROPLANE, Mr. Lindesay, a pupil of the Bournemouth Aviation Co., on his fourth solo flight, attained an altitude of 18,000 ft. on a standard 110 Le Rhône Avro. A barograph was carried, and this was sealed before the flight. It recorded just 18,000 ft. and was not damaged in the "bad landing." The pupil said that the aneroid registered 17,400 ft. when at the maximum height.

The B.A.C. are still carrying plenty of passengers, both at Weymouth and Bournemouth.

The company intend to hold a big flying meeting on Saturday and Sunday, Aug. 21st and 22nd. A Height-guessing Competition will be held, free flights to be the prizes.

Edinburgh.

A most successful flying week has been held in Edinburgh by the Aerial Photos, Ltd., 81, George Street. Captain Bond Andrews, the director, and the two pilots of the company, Captains Kingwill and Jones, were responsible for the flights, and as the beginning of this month was an exceptionally busy one for visitors brisk business was done. The aerodrome was at Craigentinny, the scene of former successes of the same firm. Women, as usual, seemed to be in the majority for flights, though one old gentleman of 82 experienced a joy-ride and expressed himself delighted with the trip. The Aerial Photos lately carried through a flight of six hours from Edinburgh to Aberdeen and back taking photographs of the districts, cities and places of prominence, as it is their intention to create an aerial map of Scotland. The Berwickshire coast will next be photographed. On the Aberdeen trip several very fine pictures were obtained, and even though a rainstorm was troubling the photographer at times the photos turned out very clear. The same firm has been at Rothesay all the summer, and tourists have been on the aerodrome daily. The experience of joy-riding seems still to be popular in Scotland, and I am informed that the Caudron Company at Alloa will shortly start a series of trips from their station. As regards civil aviation there is "nothing doing." Turnhouse aerodrome has been finally acquired by the city, but there is no sign of any activity, and I am told that the city intend to lease the hangars and aerodrome to a private firm. Renfrew, too, is quiet, though the Beardmore firm are manufacturing machines for the Government.—MAC.

Northolt.

Mahomed Abbas Rashid, a well-known Egyptian Government official, who came to England to study aviation, has joined the Central Aircraft Company's School of Aviation, Northolt, for the purpose of qualifying for a British Air Ministry's Certificate. Mr. Rashid talks most enthusiastically of the future of the flying in Egypt. He is of opinion that Cairo will be the gateway to the East for aviation, as Port Said and the Suez Canal are for shipping.

Over 150 members of the North London Motor Cycle Club visited Northolt Aerodrome on Aug. 8th. Many flights over London were made, and those who preferred cross-country flying were taken over Windsor and Eton.

The Central Aircraft Co. have in their hangars at Northolt several privately-owned aeroplanes, whose owners fly for the mere pleasure of flying. For a fixed sum the company house and keep the machines tuned up so that they are ready for the air at any time.

Scarborough.

The Border Aviation Company, Ltd., is still hard at work in Scarborough. In the week ending Aug 7th the machines were constantly employed, but during the past week low clouds have been a deterrent. Long cross-country flights are increasingly popular, and a return flight to Leeds was booked on Aug. 11th.

The company intend to run an aerial "travelling circus" during the winter and engagements are being fixed up throughout the country.

Sheffield.

In a new Bill which is about to receive Royal Assent power is given to the Sheffield Corporation to acquire land for an aerodrome.

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

The Royal Mail.

The Postmaster-General and the Minister of Defence are co-operating in an arrangement for the delivery of the incoming English mail by air to Sydney in order that this mail will be available for H.R.H. the Prince of Wales, K.G. Two aeroplanes, in case of accident, will be sent to Port Augusta, the eastern terminal of the transcontinental railway, to pick up the mail and convey it to Sydney. It is hoped that these machines will reach Sydney the day H.M.S. *Renown* leaves.

CANADA.

The Operations of the Air Board.

A correspondent in Canada writes :—

Though comparatively little has appeared in the general or technical Press of Europe as to aviation in Canada, we are not without definite progress in aeronautics. Public opinion is strongly in favour of development in these matters, and general interest is shown in the practical possibilities of the new science.

Parliament, like the woman letter-writer, left all that was most important to the postscript, and granted an aviation vote of about $2,300,000 (£460,000) on the last day of the session (in the first week of July). Of this $800,000 is for the Canadian Air Force, but the remainder is for general aviation work. This allocation has been made so late in the year that it will be adequate for the work that can be done.

The Construction of Stations.

Work has already begun in the organisation of civil aviation. Contracts have been signed in Vancouver for the construction of a permanent station. For this station two or three Curtiss-type H.16s are being shipped direct from England and two Curtiss H.S. 2Ls from Halifax. These with two or three Avro seaplanes will suffice for this year to carry out forest patrols, photographic survey, fishing protection, and transportation.

An aerodrome is to be laid out at Morley on the Indian Reserve. Hangars are now being constructed and some D.H.4s and D.H.9s are on the way. A wireless station is being erected.

Major R. A. Leckie, D.S.O., D.S.C., has, at the time of writing (July 17th), left for Halifax, whence he is to fly to Lake St. John in an H.S. 2L with a second H.S. 2L in company.

In Quebec Province.

The Quebec Provincial Government are keen and are building a station at Roberval. The Air Board intends to work N.W. from there over practically unknown country as far as Lake Mistassini. On arrival of further F. boats some of them are to be erected at Vickers Plant, Montreal, and will be flown down the St. Lawrence from that place.

Ottawa.

There is a small station at Ottawa from which an experimental survey of the Ottawa district in conjunction with the Surveyor-General's Department will be made. This is to be done with a view to the discovery of the exact conditions necessary for the construction of a really good aerial map.

This work is about all that is possible during the present year.—R. B.

The following is the Air Board appropriation for 1920-1 :—

The Air Board Appropriation, 1920-21.

Item No.	Service.	Amount. Dollars	Dollars
324	Air Service (General)	250,000	250,000
359	Demobilisation Overseas (payment of freight on aircraft and equipment)	300,000	300,000
452	Civil Government—		
	Salaries	50,000	
	Contingencies	50,000	100,000
535	Civil Aviation—		
	Survey of Air Routes	50,000	
	Flying operations for other Government Departments	200,000	
	Miscellaneous and experimental flying and research	50,000	
	Unpacking and carriage of aircraft and equipment	50,000	
	Upkeep and replacement of aircraft and equipment	250,000	
	Acquisition and equipment of civil air stations	200,000	
	Acquisition of emergency landing grounds	50,000	850,000
536	Military Appropriation—		
	Grant to Provincial Air Force Associations	30,000	
	Upkeep of Camp Borden, including repairs	30,000	
	Pay of officers and airmen, eight months, including rations	200,000	
	Travelling expenses	140,000	
	Flying in training	200,000	
	Maintenance and replacement of aircraft and equipment	200,000	800,000
	Total		$2,300,000

FOREIGN INTELLIGENCE.

AUSTRIA.

The Danish correspondent of THE AEROPLANE writes :—

A Sporting Meeting.

The sport club in Franzensbad has arranged an Austrian joy-ride event with passenger flights, aerial fighting and parachute drops, the erstwhile army pilots Arigi and Fritch partaking on a Brandenburg-Baby 160-h.p. Austro-Daimler and Brandenburg-Disci 200-h.p. Hiero respectively.—HI.

FRANCE.

The Esnault-Pelterie Claims.

During the past week there has been no subsidence in the excitement caused in French aeronautical circles by the claim of M. Robert Esnault-Pelterie for 20,000 francs in respect of each aeroplane fitted with any derivative of his patented control lever. He is taking separate actions against each aviation firm in turn and is obtaining injunctions preventing the Government paying outstanding debts to the firms concerned up to the amounts required to settle his claims. He has already proceeded against Morane-Borel (in regard to the past), Breguet, Caudron, and other leading firms. Judgments as to the sums to be reserved by the Government until the main issue is finally decided have in most cases been delayed for eight days.

GERMANY.

The Danish correspondent of THE AEROPLANE writes :—

Soaring Flight.

The soaring flight competition, going on at present in Rhon, of which the editor of "Flugsport" Ursinus is the driving power, has cost the life of one of the best known pre-war German pilots, who was killed on Aug. 9th in a fall from 450 ft. owing to plane breakage of his glider. Before the war Loessl put up passenger altitude records together with Hirth on the new 150-h.p. Benz-Albatros at the Vienna meeting.—HI.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

It is announced that for reasons connected with the late long-continued strike the Schneider Cup race is postponed till Sept. 19th and 20th.

The Baracca Commemoration Flights.

The postponed Francesco Baracca festivities and the solemn commemoration of that great fighter are now announced for Sept. 5th. A flight over a vast cross-country circuit is the chief sporting event.

A Lombardy Circuit.

The actuation of a short circuit of Lombardy for the small touring type of machine which recently showed up so well in the six-metres trials at Taliedo is also now possible, and is to take place in August over a distance of about 200 kilometres, passing over most of the flying camps in the Milanese province and as far out of it as Cameri. A cup is offered to the winner by Sig. Luigi Mapelli, of the S.A.I.A.M., the new company operating from Taliedo.

The F.A.N.I.

The F.A.N.I., as the It.Ae.C. perhaps incorrectly styles itself, now announces that at a general meeting held on June 27th at Rome it nominated Comm. Mercanti as its delegate for the Schneider Cup and authorised the Venetian Ae.C. to nominate another man. France has nominated Paul Rousseau. The sending of a military escadrille, various private machines from civilian concerns, and two balloons to Antwerp was permitted.

The Club's Gran Premio—Grand Prix—will not be held till 1921. Signori Mercanti, Pavia, Negretto, Crosti, and Prato were delegated to attend the International Aeronautical Conference at Geneva, with the assistance of Col. Morelli, the Club's general Secretary, at which Italy will propose a great international aero-motor competition.

A strongly-worded memorial to the Government calling attention to the needs of aeronautics in Italy at present was voted.

Civil Aviation.

Civil Aviation affairs having now passed under the wing of the Minister of War, a very able civilian, for the moment a great sweep-out is occurring in the late Department. The decree ordering the changes institutes a sort of Council of some 15 persons nominated by the War Office from among M.Ps. and the various Ministries concerned by the provision of aerial transport facilities of either a permanent nature or meeting certain exceptional occasions, general strikes, and so on. The Ministries of Public Instruction and of Public Worship do not appear among these, the latter being so fortunate as to be served by the great St. Michael's brigade, whose "good and laudable service" is the only thing of the sort still left us!

Two New Companies.

In spite of the difficulties of the times two more companies of faithful believers are in the advertising stage. The bigger with two million lire of capital paid up is the Società Industre Aereonautiche e Meccaniche Italia Centrale of Perugia, and has sheds at S. Feliciano on the classic Trasimene Lake.

The other, the Società Anonima Imprese Aeree, of Milan, with 600,000 lire capital, is that mentioned in a recent report of mine as a North Italian Aero Trust.—T. S. H.

NORWAY.

The Danish correspondent of THE AEROPLANE writes :—

Always considered a difficult route to fly, the Christiania-Stockholm trip has now been covered twice at short intervals and in all cases on British aeroplanes with Anglo-Norwegian pilotage. His intermediate landings in Denmark, after having stopped for fuel when off his course at the Kiel Channel, having been due to necessary overhauls of the engine after the bad effect of the German benzole acquired, Tryggve Gran was the first to cover the distance between the two Scandinavian capitals. He started with fine weather at 10.40 p.m. from the Kjeller Aerodrome and arrived at Stockholm at 2.05 in the morning. When starting here, the machine, an A.W. F.K.8, had an accident and caught fire.

While the aeroplane was totally burnt, neither Tryggve Gran nor his passenger Carter was injured.

Not in for competition, Capt. Musterlin was next to make the flight, planned and interrupted last winter by the snow. The start was delayed by a motor-cycle accident of the British pilot, Flight-Serjt. Roger. This Handley Page biplane, G-EAKE, was smashed in trying to start from a field at Stockholm.

The Norwegian Lieut. Nass was the third to fly from Christiania to Stockholm, his start on the Norman-Thompson flying-boat N.13 being delayed 14.20 in the morning owing to engine trouble. The Stockholm shipowner Meyer was the observer passenger. Karlstad was reached at 15.55 after a strenuous flight in wind and rain. Restarting at 14.00 hrs. next day, Stockholm was reached at 19.40. Lieut. Nass has with better success continued his Scandinavian circuit flight, having so far flown to Copenhagen.—HI.

SCANDINAVIA.

The Danish correspondent of The Aeroplane writes :—

Once more it looks as if competition is going to have the best speeding-up stimulus and that the two main competitors from the London-Paris and Bruxelles-Amsterdam air services shall meet again in extended activities. In the first reports it was stated that the air navigation company of Flight. Lieut. Tancred Ibsen, who has recently flown some of his Brandenburg and Friedrichshafen seaplanes to Norway from Warnemünde *via* Copenhagen, was to start Anglo-Scandinavian air lines in co-operation with Handley Page, Ltd.

In consequence, it was reported that Aug. 10th was the date on which to inaugurate the long-planned extension of the Amsterdam Air Transport and Travel, Ltd., service in order to forestall the other plan.

Copenhagen is to be the chief junction, and "Det Danske Luftfart Selskab," "Svenska Lufttrafik A.B.," "Deutsche Luftrederei," and the Dutch affiliated concern, will co-operate with Air Transport and Travel, Ltd The machines of the latter company are to extend their service to Copenhagen with an intermediate landing at Hamburg, while L.V.G. biplanes, as owned by the Danish company, are to be used between Berlin and Copenhagen and from Hamburg to Warnemünde, so far as can be understood.

Seaplanes are to be employed between the latter city and Malmö for passengers, requiring connection with the Christiania and Stockholm trains.—HI.

SWEDEN.

The Danish correspondent of The Aeroplane writes :—

Statistics of Flying Accidents.

The Swedish Flying Commission has to Government order worked out statistics of the flying accidents in Sweden up to the end of 1919. These statistics have recently been sent to the Government, together with a secret report.

From 1912 to 1919 inclusive 81 severe flying accidents occurred in Sweden. The cause of most of these were errors in manœuvring. Seventeen of them were fatal. Five fatal and 19 serious accidents were due to defects of the material, 3 fatal accidents and 10 accidents were caused by bad weather conditions, and 2 accidents were due to indisposition of the pilot. Engine defects caused 10 accidents, and 9 accidents were due to difficult ground conditions.

In Sweden the army and naval pilots covered during 1918 146,240 km. in 1,243 flights of 1,547 hours' duration. Eleven accidents, 3 of which were fatal, occurred this year, which works out at one accident for each 13,300 km. and 140 hours flown, and 49,000 km. and 1,515 hours per fatal accident.

The flying performance in 1919 was 219,370 km. and 2,143 hours, and the accidents amounted to 13, 4 of which were fatal, which equals an accident for each 16,900 km. and 164 hours, and 55,000 km. and 531 hours per fatal accident.—HI.

The Faireys' Flight to Finland.

Lieut.-Col. G. L. P. Henderson, M.C., A.F.C. (late R.A.F.), recently flew from Stockholm to Helsingfors in 3¼ hours. He used one of the P. O. Flygkompani's Type IIIc Faireys fitted with floats and painted white all over with the exception of that part of the fuselage that accommodates the pilot and passengers which is finished in black. After a few hours' flying around Stockholm on May 1st by way of a test, the machine was ready for the flight to Finland. He left Stockholm at 14.30 on May 5th and landed at Helsingfors at 17.45, carrying as passengers Lieut. P. O. Herrström, his partner, a big man from Stockholm, and a Finnish lady who was returning home. Several hundred copies of Stockholm newspapers were also carried. En route, Lieut. P. O. Herrström dropped a wreath on the grave of Baron Cederström, who was drowned in attempting the same flight some years ago, and also dropped a second wreath in the Baltic on the spot where it was assumed he lost his life.

A further communication from Sweden says that, in addition to Löjtnant Herrstrom, the fattish gentleman, the Finnish lady, and the newspapers, the Fairey seaplane carried luggage for all, food and drink for 24 hours, engine spares and tools, 90 gallons of petrol and 6 gallons of oil. On arriving at Helsingfors the machine was taken to an improvised anchorage—an ordinary mooring buoy—to which buoy the machine rode for three days and nights while the arrangements were made for future journeys.

The Finnish authorities were extremely obliging. Löjtnant Herrstrom interviewed personally the Chief of the General Staff, the Chief of the Army, the Chief of the Air Force, and the Harbour Master. Full permission was given to use the harbour and to take up passengers, subject to a few reasonable restrictions as regards flying over fortresses. It is necessary to remember that the country is still at war, but the Chiefs of the Forces are Finnish men of business who, though new to their work, have the common sense to allow flying to take place because of the good that it does. Furthermore, it is noteworthy that it only took half a day for all of them to give their respective decisions.

The return journey was started on Saturday, May 8th, at 14.30, the machine carrying two passengers besides the pilot. Owing to a strong south-westerly gale, it took 1¼ hours to cover 70 miles. A sea mist then came over everything and the machine had to alight at a Finnish village, where it was tied up to a pier. Two hours later the machine started again and reached Abo, also in Finland, its destination for the day.

The following day the machine started at 12.30 and had to face a still stronger gale, but by flying at 50 feet over the Aaland Archipelago and open sea, the widest part being about 100 miles, and still lower down the channel inside the Swedish Skargard (archipelago), the 170 miles was covered in 3¼ hours. The total distance of 290 miles took 5 hours to cover against the gale which, considering the circumstances, is good going.

By following the islands for the whole route there is only 30 miles of open sea to be covered, so that, unless the machine flies on a compass course, it is always within reach of land. For this reason the route should be a success.

The interest of the inhabitants both in Sweden and Finland is very great, and the Press of both countries is enthusiastic over the venture. Under hardly any circumstances could the journey from Stockholm to Helsingfors take more than 5 hours, and with favourable winds it may take much less than three. This compares with the steamboat journey of 24 hours. The fare to be charged by the P. O. Flygkompani is 500 kr. against 150 kr. by steamer, and the Swedes, who are now a wealthy nation, regard the fare as very reasonable.

Both at Stockholm and at Helsingfors the machine alights within a mile of the best hotels, so that this arrangement compares very favourably with the London-Paris arrangement.

An Accident

On July 22nd, Mr. Park, one of the pilots of the P.O. Flygkompani, while flying at Gefle, Sweden, was brought down in a nose dive, the machine being destroyed. He was unconscious for a short time, but his injuries are slight. His mechanic was unhurt.

SWITZERLAND.

Civilian Aerodromes.

There are now three international aerodromes in Switzerland, situated at Dubendorf, near Zurich, La Blécherette, near Lausanne, and Cointrin, near Geneva.

FLYING IN SWEDEN.—One of the P.O. Flygkompani's Fairey Biplanes. These machines have done a large amount of flying during the last spring and have made several long-distance flights, including one to Finland. They are used on skis (as shown) during the winter and on floats in the summer.

Cointrin has only just been sanctioned as an international aerodrome, but it will not be ready for the reception of aircraft until the end of the summer; while Collex-Bossy, near Geneva, which will replace Cointrin, will not be in a fit state for use for another three years.

The Danish correspondent of THE AEROPLANE writes :—

A Swiss Concern.

The Swiss joy-riding concern, Ad-Astra-Aero, Sweizer Luftverkehrs A.G., Urania Str. 22, Zurich, which has had the loan of the first commercial Dornier twin-central-engined duralumin flying-boat, is the owner of a fleet of Austrian Lohner and Italian Savoia and Nieuport Macchi flying-boats, and has acquired lately some German Kondor landgoing aircraft of the C class, as well as the wireless 200-h.p. Goebel rotary-engined parasol monoplane. This firm advertise in the German aero journals to the effect that their chief pilots, Comte, Pillichody, and Kramer, are in charge of their flying school and Alpine and joy-riding flights on two to four seaters, while Mittelholzer looks after the photography department. The latter possesses more than 1,200 views of the cities and mountains all over Switzerland, and sells albums, enlargements and postcards and carries out advertising, industrial and scientific work.

It reports for June : 611 passengers were carried in 406 flights of 75 hours' duration. The author, T. C. Hui, made an Alpine flight of two hours on June 29th from Lugano over St. Gothard to Zürich in an enclosed three-seater, and the two pilots, Frick and Pillichody, attained the maximum performance in so far as they carried 74 passengers in one day during the Rappersnil meeting.

At Luzern they were favoured by the weather each Sunday, several members of the Grecian Court staying there having taken seats, and the circular flights round Geneva were well patronised.

One fails to see the originality claimed by an insurance company in awarding flights as lottery prizes, unless it is pleasant to see an insurance firm endorsing the safety outlook upon aviation.—HI.

UNITED STATES OF AMERICA.

An Airship and Deep-Sea Fishing.

During the early part of last month the idea of fishing from the air was conceived by two aeronautical heads of departments of the Goodyear Tyre and Rubber Company in California, who, starting out early one morning in a 95-ft. long airship, known as "Pony Blimp D.57," flew to San Pedro Harbour. After studying the water from the air at the low altitude of 40 ft. until they saw a school of fish in 15 ft. of water, they dropped to the surface and floated on a pontoon which is attached to the cabin of the ship, and threw out their lines.

They were so successful in a short time that they started the engine of the "Blimp" at a low speed and went out into a deeper water with a still greater success. So contagious has the excitement of fishing from the air proved in Los Angeles that the "Pony Blimp" is being booked up some time ahead for similar trips. It is intended to use this airship in the fishing-ground of Catalina Island, 30 miles from the California shore.

The Danish correspondent of THE AEROPLANE writes :—

The American Gordon Bennett Entries.

The new 500-600 h.p. Packard engine is to be the power plant of the Verville scout, which the McCook Field is entering for the Gordon Bennett race.

Single I struts are used in this biplane, which has a reduced gap, obtained by mounting the top planes direct on the body. The two other entries are from the trade; viz., Curtiss and Dayton-Wright. Both are monoplanes, Curtiss employing his own 300-h.p. engine, developing 410-h.p., and now having a detachable cylinder head per block, while a 300-h.p. Hispano-Suiza engine drives the tiny Dayton-Wright in which Mr. Grover Loennig has a share, who was himself a would-be entry with another small wireless monoplane. The pilots are to be respectively Roland Rolffs and Rhinehardt, though as the Curtiss Gordon-Bennett racer has been built to the order of an enthusiastic private owner, his own pilot has also gone into training.

The Stout Cantilever Wing Aircraft.

A new venture in American aviation is the Stout Engineering Laboratories in Detroit, the president of which, Mr. Stout, was formerly an aeronautical writer with Automotive Industries of New York, afterwards Government adviser, and later with the Packard Company.

It is interesting to compare the thick wing and metal work with the similar work going on contemporarily in Germany.

The new enterprise has recently received an order from the Navy for six twin-engined all-metal torpedo carriers. As in the Zeppelin-Staaken four-engined 18-passenger carrier, described long ago, the engines are mounted in the planes at the lead-

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ing edge. The torpedo and bomb compartment, to house mail or passengers in commercial editions, is 30 ft. in length, 8 ft. in beam, and 6 ft. in height, and the span of the planes is 100 ft. by 7 ft. chord.

During a visit to the works at Wellington Avenue a commercial thick-wing three-seater monoplane was being constructed. The wings are thick and of big chord at the root, tapering towards the ends in both dimensions. Plywood is employed both for the internal structure and for covering, the three-ply of the latter being only 1/20 inch in thickness. The radiator is retracted during altitude flying and the heat utilised for warming the pilot and passengers.

Mr. Stout is chiefly a believer of a future for aeroplanes as goods carriers, flown with efficient wings.—E. H.

A Cinema Tragedy.

Lieut. Locklear and his assistant, Lieut. Elliot (both late U.S. Army Air Service), have been killed at Los Angeles, Cal., whilst performing for the cinema. It is reported that whilst flying at night in the beams of five searchlights, Lieut. Locklear dropped a rocket, which he followed with the nose of the machine.... In trying to pull the machine up, it caught fire, ignited, it is said, by the rocket. The machine fell 1,000 ft. The amount of morbid interest Lieut. Locklear created in the United States by his absurd and useless "stunts," such as passing from one aeroplane to another whilst in flight, standing on his head on the top plane, etc., earned for him, according to the Press, the title of the "Dare-Devil Aviator."

It is a pity that the English daily Press should devote so much of their valuable space to reporting, under headings such as "Air Dare-Devils' Tragic Fate," "Dare-Devil Pilot Killed," "Chased a Rocket," etc., the idiotic eccentricities of these super-lunatics who have been lowering aviation to the standard of a fourth-rate circus. Now that they are gone we may hope that no one else will endeavour to appeal to the blood-thirsty tastes and the low mentality of the general public by emulating their bad example.

Ford to Make Aircraft.

The Ford Motor Company and the firm of Henry Ford and Son, the latter firm being responsible for the "Fordson" tractor, are to be consolidated and reorganised with a capital of twenty millions, and it is reported that they will undertake the manufacture of aircraft, whether of their own design or under licence is not yet known.

The Aero Club of the Northwest.

The Seattle Flyers' Club has joined forces with the Aero Club of the Northwest. Both organisations are continuing together under the latter's name. The Flyers' Club started last year, but the Aero Club was formed during the war by a number of prominent business men to assist the Air Service and the men therein. The club is affiliated with the Aero Club of America.

The first announcement made by the new club was the proposal of a seaplane race to Alaska to be held in the present summer. The proposal elicited much response, and it was stated that Capt. Sir A. W. Brown and Mr. Cliff Durant were desirous of entering the race.

Aerial Age states that the south-eastern Alaskan coast is not icebound, but kept mild by the Japan current. For seaplanes a sheltered alighting place is always within gliding distance.

The Aero Club are endeavouring to raise enough money for the construction of an aerodrome at Seattle. They are conducting a campaign for 3,000 members and have started a petition to the Post Office to obtain aerial mail service to Alaska. The mail from the United States to Alaska is at present shipped as freight. Weeks could be saved in some places if aeroplanes were used.

A Long Flight by a Junkers Monoplane.

On June 27th the Junkers cabin monoplane (185 h.p. B.M.W.) belonging to the Larsen Aircraft Corporation and known as the J.L.6, made a non-stop flight from Omaha, Nebraska, to a point 20 miles east of Lancaster, Pa., a distance of 1,200 miles, in 10 hr. 58 min.

Piloted by Mr. Bert Acosta, and carrying Mr. J. M. Larsen and a mechanic as passengers, the flight was made in foggy and windy weather, the maximum height reached throughout the trip being 4,000 ft.

In Mr. Larsen's parlance the machine "shimmied" all the way from Omaha to Lancaster, a strong south-west wind "crabbing" it every mile of the way.

On landing in a wheat-field, one of the wings fouled a tree, the result being a dent in the metal.

THE AIR NAVIGATION BILL IN THE LOWER HOUSE.

Their Lordships, having considered the terms of the Air Navigation Bill introduced by the Marquess of Londonderry as Under Secretary of State for Air, having amended it as seemed to them proper, passed it through all its stages in the Upper House early in the present session. The Bill thus approved came before the House of Commons for a Second Reading on Aug. 9th, 1920.

Mr. Churchill in his opening statement said that the Bill was "the Parliamentary embodiment of the Air Navigation Convention, which was signed in Paris on Oct. 13th last year." Over thirty States, including the King's self-governing Dominions, signed the Convention. It was likely the volume of air navigation laws, thus constructed, "will attract to themselves the remaining States and will thereby become the governing air navigation laws for the whole world."

He described briefly the contents of the Bill. As aviation is rapidly advancing in efficiency and in its application to the common life of the people, it is inadvisable at present to lay down cast-iron codes of rules at this stage. Hence there is set up a "Permanent Commission, composed of representatives of the contracting States, and this Commission is empowered, subject to the basic principle of the legislation and of the Convention, to alter from time to time the technical annexes of the Convention in step with the march of aviation."

The Bill gives local authorities power to acquire land for aerodromes "by voluntary agreement." The law of trespass in aerial matters is defined and adapted to the conditions of the present and future. The "absolute liability by the owners of aircraft to compensate injured persons on the ground without any question of proof of negligence" is laid down. The Bill preserves "the right of the individual on the ground to some protection from objects which may descend from the superincumbent air." Power is given to institute action against British aviators, etc., who commit crimes in the air over this country, foreign countries, and the intervening waters.

It was not proposed to hurry this measure through the House and there was no intention to dispose of the measure until the end of the year. There were many intricate points which deserved detailed consideration in Committee. Mr. Churchill therefore asked for a Second Reading.

Sir Donald Maclean said those things which were to be expected of him in terms of exact platitudes.

Colonel Greig repeated the Secretary of State's arguments and came to the same conclusion, a happy proof of a logical if unoriginal mind.

Lieut.-Commander Kenworthy, whose fiery disloyalties so often amuse a tired House, spoke at some length. With consistent perversity, in dealing with a subject of which he knew but little, he spoke reasonably and with intelligence. He said that he agreed with the Bill and its objects and regretted only the delay in bringing it forward. He thought that aviation would destroy artificial frontiers and would do "more to bring about real, practical internationalism than anything else."

Firmly convinced of the necessity of fostering civil aviation he quoted figures as to the work done on the London-Paris-Brussels air routes. He asked for Government encouragement and said that he was "sorry to see that aeroplanes which might have been utilised—some of those war machines which are best suited for commercial purposes, such as the Handley Page bombers—are being sent to Danzig at the present time instead of being used for commercial aviation in this country."

Referring to the Hull-Holland service which must now be carried out via Lympne, he said that the Air Ministry forbade direct flights across the North Sea because of the risks to personnel consequent on the long oversea flight. He said that such risks were the airman's own business and that dry nursing was unnecessary. [He does not understand that the Air Ministry would not oppose a direct *sea*plane service.]

Because of its inconsistency with Mr. Kenworthy's often reiterated opinions the following passage is reproduced verbatim :—

"One way of really encouraging civil aviation would be by the formation of a strong aerial reserve. If the mechanics at the municipal aerodromes and the pilots flying in commercial companies were enrolled as a matter of course, just as the officers and most of the seamen in our great shipping lines are as a matter of course members of the Royal Naval Reserve, that alone would do much to help on civil aviation. It would keep the men together, and it would be something in the way of a subsidy, and, furthermore, it would encourage young men to go into the Air Service. . . . An efficient and flourishing aviation service in this country, and the development of civil aviation in every way, is of the very first importance, if for no other reason than the need of a great reserve of trained airmen and trained mechanics. For that reason I welcome this Bill."

In conclusion he thought that money spent on airships was wasted. The airship, in his view, was to the aeroplane what the sailing ship was to the steamship. So he concluded "with joy to everyone," as Mr. Pepys would have said.

After a few words from Mr. Rawlinson the Bill was read a second time and was committed to a Standing Committee.

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NEW COMPANIES.

Harrogate Aerodrome and Land Development Co., Ltd.—Private company, registered July 21st. Capital, £26,000 in £1 shares. To adopt an agreement with A. E. Johnson, J. Butterworth, H. Wignall, G. W. Halliday, C. Grainger, A. Wiseman, and R. Holmes for the acquisition of certain land and buildings at Harrogate; to lay out the same for building purposes, or for use as aerodromes, etc. The first directors are: A. E. Johnson (secretary), 6, Market Street, York; J. Butterworth, 16, Chapmangate, Pocklington; H. Wignall, Coppergate, York; G. W. Halliday, 37-39, Parliament Street, York; C. Grainger, 41, East Parade, York; A. Wiseman, Plantation Farm, Poppleton Road, York; R. Holmes, Ebor Dairy, York. Registered office: 6, Market Street, York.

Sir W. G. Armstrong, Whitworth Aircraft, Ltd.—Private company. Registered July 30th. Capital, £20,000 in £1 shares. The objects are: To carry on the business of manufacturers of and dealers in and agents for aeroplanes, dirigible and other balloons, airships, motors, voltmeters, bobbins, bobbin paper, insulated wire, linoleum, waterproof and other fabrics, etc. The subscribers (each with one share) are: Rear-Admiral C. L. Ottley, 8, Great George Street, S.W.1; N. W. Smith-Carington, 8, Great George Street, S.W.1, barrister. The first directors are to be appointed by the subscribers. Solicitors: Johnson, Weatherall and Co., 7, King's Bench Walk, Temple, E.C.

Mortgages, Charges, and Satisfactions.

Portholme Aircraft Co., Ltd.—Satisfaction in full on July 7th, 1920, of debts dated Feb. 25th, 1910, securing £18,000.

AIRCRAFT IN PARLIAMENT

HOUSE OF COMMONS.

Aug. 10th.—The following oral answer was given:—

EX-SERVICE MEN—AIR DEPARTMENT.

Mr. HOGGE asked the Secretary of State for Air whether disabled officers are being resigned from his Department while men with no real war service, with considerable private incomes, have been appointed to sectional directorships.

Mr. CHURCHILL: I am informed that only one disabled officer is under notice of discharge, and every endeavour is being made to find him further employment suited to his experience. I may add that no ex-Service man, whether disabled of not, is discharged from the Air Ministry until his case has been considered by the Air Ministry Ex-Service Men's Employment Committee, on which a representative of the ex-Service men sits. The suggestion that the claims of disabled officers are not given every possible consideration is quite unwarranted.

Mr. HOGGE: Is it not a fact that the recent appointments to the sectional directorships are held by men as stated in this question? Is the right hon. gentleman aware that there are a great many more than one disabled officer who have served throughout the war now being resigned from his Department?

Mr. CHURCHILL: I have made inquiries, and I do not think that the facts at all bear out that view.

Mr. HOGGE: I will raise this on the Adjournment on Thursday.

* * *

Aug. 11th.—The following written answers were given:—

ROYAL AIR FORCE.—AEROPLANES, AIR STATIONS, AND PERSONNEL.

Mr. PURCHASE asked the Secretary of State for Air the number of aeroplanes that are now being utilised, the number of air stations in England and Wales; and the staffs employed there.

Mr CHURCHILL: The total number of machines being utilised is 5,174. This number makes provision for initial equipment, reserve and wastage. There are 45 air stations, including depots and seaplane stations, in England and Wales, and the personnel employed total 1,389 officers and 16,750 other ranks.

IRELAND.—SINN FEINERS (AEROPLANES).

Captain FOXCROFT asked the Secretary of State for War whether aeroplanes manned by Sinn Feiners, wearing British uniforms, recently visited certain British camps in the West of Ireland; and whether there is any reason to believe that these aeroplanes were Government property during the war.

Mr. CHURCHILL: I am informed that nothing whatever is known of this matter, and I think it may safely be assumed that the whole story is a fabrication.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

Air Ministry, Aug. 10th.

ROYAL AIR FORCE.—Short Service Commissions.—The following officers are granted short service commns. in ranks stated, with effect from dates indicated, retaining their seny. in substantive rank last held by them prior to grant of this commn., except where otherwise stated:—

Flight Lt.—R. G. Gardner, D.S.C. (A.), July 28th.

Flying Officer (from Flight Lt.).—R. H. Daly, D.S.C., D.F.C. (A.), Aug. 4th.

Flying Officers.—H. E. Cardwell, A.F.C. (A.), July 26th; B. B. Caswell (A. and S.), July 26th; C. Chambers (A.), Aug. 3rd; R. J. Divers (A.), July 29th; J. H. W. Goodall (A.), Aug. 9th; C. G. Halliday (A.), Aug. 4th; S. C. Harker (A.), July 27th; C. S. Hartung, M.M. (A.), July 30th, and with seny. of that date; C. M. McClean (A.), Aug. 5th; A. P. Ritchie, A.F.C. (A.), July 14th; A. C. Sanderson, D.F.C. (A.), May 10th (substituted for notification in "Gazette," May 18th); J. C. Walker (A.), Aug. 9th; G. N. Wilton (A.), July 24th.

Observer Officer.—J. A. Hollis, Jan. 6th (substituted for notification in "Gazette," Jan. 6th).

Flying Officers (from Pilot Officers), with seny. of dates indicated.—C. H. Baker (A.), Aug. 3rd; A. E. Beilby (A.), July 26th; C. N. C. Dickson, A.F.C. (A.), July 25rd; V. C. Cordingley (A. and S.), July 26th; G. A. Elliott (A.), July 31st.

Flying Officer Daly will be placed at head of list of Flying and Observer Officers, and will retain seny. relative to officers who have been similarly gazetted to short service commns. in a rank lower than their previous substantive rank, in accordance with his previous position on gradation list.

The notifications appearing in "Gazettes" of dates indicated below, appointing following officers to short service commns., are cancelled:—Flying Officer G. J. Stroud, M.B.E. (T.), Sept. 12th, 1919; Flying Officer F. Adams (T.), Oct. 24th, 1919; Flight Lt E. Gribben, M.C. (A.), May 4th.

The rank and classification of Flying Officer J. C. Bulteel (A.) are as now described, not Observer Officer, as stated in the "Gazette" of Dec. 5th, 1919.

Flying Branch.—Sec. Lt. H. Roberts (O.) is placed on the retired list, Aug. 11th.

Dental Branch.—Flying Officer R. H. Moore to be Flight Lt., Aug. 1st.

Air Ministry, Aug. 13th.

ROYAL AIR FORCE.—Permanent Commissions.—Flight Lt. J. H. Porter, M.C., M.B. (Medical), is granted a permanent commn. in the rank stated, May 11th, seny. next below Flight Lt. A. J. O. Wigmore, M.B. (substituted for notifications in the "Gazettes" of June 15th and July 13th).

Technical Branch.—Flight Lt. S. Frost to take rank and precedence as if his appt. as Flight Lt. in the R.A.F. bore date March 2nd.

Chaplains' Branch.—The following Chaplains are granted relative rank as under for purposes of precedence, administration, and discipline:—

Air Commodore.—Rev. H. D. L. Viener, C.B.E., M.A. (Chaplain-in-Chief).

Wing Comdrs.—Rev. R. E. V. Hanson, O.B.E., M.A.; Rev. S. L. Clarke, M.A., B.Sc.; Rev. J. Dey, D.S.O. (with relative rank of Group Capt. whilst empld. as Staff Chaplain).

Sqdn. Ldrs.—Rev. H. Marshall, M.A.; Rev. J. R. Walkey, M.A.; Rev. W. T. Rees; Rev. R. Hall, O.B.E. (with the relative rank of Group Capt. whilst empld. as Staff Chaplain); Rev. P. C. C. Lamb, M.A.; Rev. M. H. Edwards, M.A.; Rev. C. A. B. Allen, B.A.; Rev. G. H. Collier, M.A.; Rev. D. F. Blackburn, Rev. J. Firth, M.C.; Rev. G. L. Robinson, D.S.O., Rev. H. McCalman, M.C., M.A.; Rev. J. S. Hobson; Rev. J. H. P. Still, B.A.; Rev. W. Moffatt, M.A., B.D. (with relative rank of Group Capt. whilst empld. as Staff Chaplain); Rev. S. J. Jones, M.C. (with relative rank of Group Capt. whilst empld. as Staff Chaplain); Rev. G. A. Davis; Rev. H. Beauchamp, M.C.; Rev. B. W. Keymer, O.B.E.; Rev. A. McHardy, M.C., M.A.; Rev. C. W. Hall; Rev. M. J. Dunne; Rev. J. T. S. Law; Rev. A. A. Crawshaw, M.A.

* * *

The following communiqué was issued by the India Office:—

The names of the following have been brought to notice by the Commander-in-Chief in India for valuable services in India in connection with the operations against Afghanistan, 1919:—

Buesnal, No. 12592 Srjt. H. E., R.A.F.; Dolphin, Capt. (actg. Maj.) W. H., R.A.F.; Funnell, No. 406434 Cpl. C., R.A.F.; Daw, No. P.1400 Actg. Srjt. J., R.A.F.; Robertson, Lt. ((actg. Capt.) J., R.A.F.; Rouch, Lt. (actg. Capt.) E. K., R.A.F.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of The Aeroplane. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

Engagements.

GLEN—CAUNTER.—A marriage has been arranged, and will shortly take place, between Capt. J. M. Glen, M.C., R.A.F., and Miss Grace Caunter, elder daughter of Brigadier-General J. E. Caunter, C.B., C.B.E., and Mrs. Caunter, of Trevoria, Torquay.

HILL—JACKSON.—The engagement is announced of Harold Gardiner Hill, M.B., M.R.C.P., late Major, R.A.F., eldest son of Hugh Gardiner Hill, of Pentille, Leopold Road, Wimbledon, and Nancy Elizabeth Jackson, younger daughter of Mr. and Mrs. Tom Jackson, of Waterfoot, Heaton, Bolton.

Marriages.

BLOFELD—SWEETLAND.—On Aug. 12th, at St. Martin's, East Woodhay, Hamilton Blofeld, late R.A.F., second surviving son of Mr. and Mrs. H. Blofeld, "The Woodlands," Sydenham Hill, was married to Grace Sybil, only daughter of Mr. Frank Sweetland, of "The Grove," East Woodhay, by Dr. Wilson.

MONTAGU—CRAKE.—The marriage took place on Aug. 10th, at St. Margaret's, Westminster, of Lord Montagu of Beaulieu and Pearl, daughter of the late Major E. B. Crake, Rifle Brigade, and Mrs. Barrington Crake, of 29, South Street, Thurloe Square, S.W. The Rev. R. F. Powles, vicar of Beaulieu, officiated.

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COMING EVENTS.

AUGUST

25th, Wed., 26th, Thurs.—R.A.F. *v.* Army Cricket Match at the Oval.

SEPTEMBER.

1st, Wed.—British Government Competition, Amphibian Competition at Felixstowe.

8th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva.

18th, Sun, 19th, Mon.—Schnieder Cup Race at Venice.

27th, Mon.—Gordon Bennett Aviation Cup Meeting near Paris begins.

OCTOBER.

2nd, Sat.—Gordon-Bennett Aviation Cup Meeting near Paris closes.

23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.

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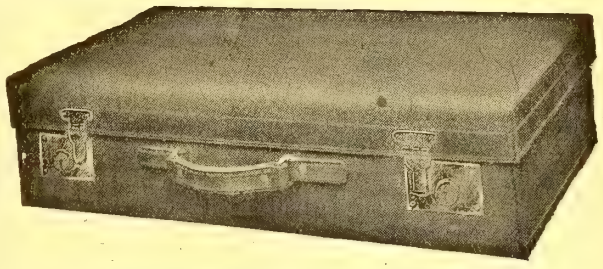

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AUG. 25, 1920.

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ON SAFETY, COMFORT, AND ECONOMY—II.

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It is situated just where an experimental aerodrome should be, that is to say, far enough from civilisation to be free from crowds of trippers when tests are being done, and near enough to towns to be convenient to the personnel. It is a little over a mile from Woodbridge, a very pleasant old-fashioned market town, where married officers can live pending the building of married quarters. It is four or five miles from Ipswich, one of the best shopping centres in England, where well-made clothes can be bought better and cheaper than in London. And it is eight or nine miles from Felixstowe, where young officers and men can enjoy all the frivolity they need.

It is equipped with all the workshops, test shops and everything else that an experimental aerodrome can want. It has more level surface with a clear view than any aerodrome of one's acquaintance. It is covered with fern and heather, which needs less keeping down than grass. It is almost all composed of sand, so that it is never muddy, even in the worst weather. And, being sand and heather, it is useless for agricultural purposes, so that the Air Ministry is not decreasing food production as is, for example, the motor dump at Slough. The only food produced there is honey from the heather, and apparently the bees and the aeroplanes occupy the air together quite amicably and without mutual interference.

In fact Martlesham is the ideal experimental aerodrome, and congratulations are due to the genius who discovered it as well as to the eminently sensible person who decided to hold there the Air Ministry Competition for Safety, Comfort and Economy.

The Tragedy of the Blasted Heath.

All of which is probably why it is proposed to pull the whole place to pieces, lay waste the little R.A.F. town, and return the Heath to its pristine desolation. The moving power behind the proposed waste seems to be the desire of a few amiable old gentlemen to go shooting dicky-birds over the Heath, which they are unable to do while the R.A.F. fly aeroplanes over it, partly because they themselves might get in the way of the aeroplanes, and partly because the aeroplanes make the aforesaid birds so wild that the aforesaid amiable old gentlemen are unable to walk up to them.

Apparently, the actual owner of the Heath—which looks rather as if it were in reality Common Land which, like so much more land which was common property under our excellent Feudal System, had at some time or other been appropriated by some soulless plutocrat—is a Colonel Pretyman, M.P., who holds or held some sort of minor political office under the present Government. It is said that the Heath was taken over from him on the understanding that it was to be returned to him in its original state six months after the official end of the war.

In spite of this the Air Board (before the Air Ministry came into existence) decided to make it a permanent station. So, after the Air Ministry was formed, big permanent sheds were built, fences were erected across rights of way, and other work designed to last for all time was done. This work was continued after hostilities ceased, and after Colonel Pretyman had given notice that he desired to resume possession.

It is believed that Colonel Pretyman was annoyed by the way in which R.A.F. people—and others—used in the past to poach on his shooting rights. So, as the story goes, instead of negotiating with him, the Air Ministry sent him an official letter thanking him for allowing R.A.F. officers free shooting over his lands.

The result of it all was, according to such information as is available, that Colonel Pretyman offered to lease the Heath to the Air Ministry for five years at the very high rent of £1 per acre, on the condition that at the end of the lease the Heath is to be cleared of all buildings, sheds, and other erections and enclosures. This offer was turned down as being ridiculous, but it is alleged that it has since been accepted. Which means that in five years' time, or less, some tens of thousands of pounds will have to be spent in re-creating a wilderness out of a highly organised experimental aerodrome which has cost some hundreds of thousands of pounds to build. And all because Colonel Pretyman and his friends want to go shooting.

Comparative Values.

One would like to suggest that if Colonel Pretyman would take a practical interest in the work of the aerodrome he would find it far more amusing than merely shooting birds and he would be of much more use to his country. There is at least as much fun in snap-shooting an aeroplane with a camera when it is doing a speed test or a get-off test as there is in shooting a grouse or a partridge, and the result is of greater value and profit.

Some logical sportsman once described pheasant-shooting in particular as: "Up gets a guinea, bang goes twopence-halfpenny, and down comes half-a-crown." The price of rearing a pheasant, the cost of a cartridge, and the value of a dead bird have changed since then, but the principle remains. And the permanent value of a shilling photographic plate, when it records the performance of an aeroplane under official test, is certainly higher than that of any dead bird. Similarly, the permanent value of the work done by the technical staff at Martlesham Heath in acquiring and storing for the benefit of future generations figures relating to the performances of aeroplanes for peace and war is infinitely greater than the value of anything which could be produced on Martlesham Heath in any other way.

If Colonel Pretyman desires to go down to posterity as a benefactor to his country he will present the flying rights over the Heath to the Royal Air Force, remaining legally and nominally the owner of the land. He might even reasonably ask for a reasonable rent for the actual ground on which the sheds, barracks and so forth are built. But £1 an acre for a wilderness of heather and fern is exorbitant. As land it is not worth half-a-crown a square mile. And its value as shooting country depends entirely on what some silly peace-profiteer would be willing to pay for the satisfaction of talking about "my little shoot in Suffolk." As a source of food supply to the Nation is is worth nothing.

A Prospective Move.

Rumour has it that the Air Ministry's intention is to remove the whole Experimental Establishment from Martlesham at the end of the five years to the airship works (lately Short Bros.') at Bedford. This would mean a dead loss of all the hundreds of thousands of pounds spent at Martlesham on new buildings and general development, and the expenditure of some tens of thousands at least in making a new aerodrome at Bedford.

If the present Government continues its present insane methods there seems every chance of a Labour Government being in power five years hence. In which case Colonel Pretyman would stand very little chance of getting back his heath in its primitive state. It is possible that there might then be no R.A.F. to conduct experiments at Martlesham, but certainly no Labour Government would spend money and labour in giving back Colonel Pretyman's ground to the wilderness.

Past and Present Futures.

If the story of the five years' lease and the £1 an acre rent is based on fact one cannot help contrasting it with the treatment meted out to Lord Rosebery over the Turnhouse Aerodrome—which is good agricultural land. It is true that Lord Rosebery was described years ago by Mr. Swift McNeill as "a man with a magnificent future behind him," and that therefore he may carry no weight with the politicians of to-day, whereas Colonel Pretyman may still be quite a power in the land politically. But that seems an inadequate reason for selling one man's land by auction after commandeering it under D.O.R.A., and giving to another a rent and an agreement which is right outside any reasonable commercial valuation of the property.

Apart from which the Turnhouse Aerodrome, and others whose owners have been similarly treated, are "for disposal" as being no longer of use to the R.A.F., whereas Martlesham Heath is not merely of use to the R.A.F. as an aerodrome, but is in fact of the very highest value to the British Empire by virtue of the benefit which the work which has been and is being and will be done there confers on the progress of British Aviation. If Colonel Pretyman can show that he is definitely out of pocket by reason of the Air Ministry retaining the use of the Heath he has every right to be fully compensated. But it is absurd to suggest that the Nation should expend tens of thousands of pounds, and lose hundreds of thousands, besides definitely damaging the progress of aviation, merely so that this entirely amiable and estimable gentleman should resume the pleasure of shooting over this area, an occupation which is entirely one of pleasure and not of profit.

Right and Rights.

Finally, one desires to state that the information which has formed the basis of the foregoing remarks was not derived from anybody stationed at Martlesham, nor from anybody concerned in any way with the Air Ministry Competition. It was brought to one's attention months before the Competition began, but one refrained from mentioning the matter until one had had a fair opportunity of judging the value of the work done and the amount of money expended at Martlesham by the Air Board and the Air Ministry and of comparing them with the value of Martlesham Heath for any other purpose.

One casts no reflections on Colonel Pretyman. He is quite within his rights in trying to get all he can out of a Government which is doubtless plundering his income heavily and has so mismanaged affairs that what is left to him is only worth half what it used to be worth. Also, no doubt, from the point of view of a country gentleman, his sacred shooting rights are worthy of more consideration than is the progress of aviation.

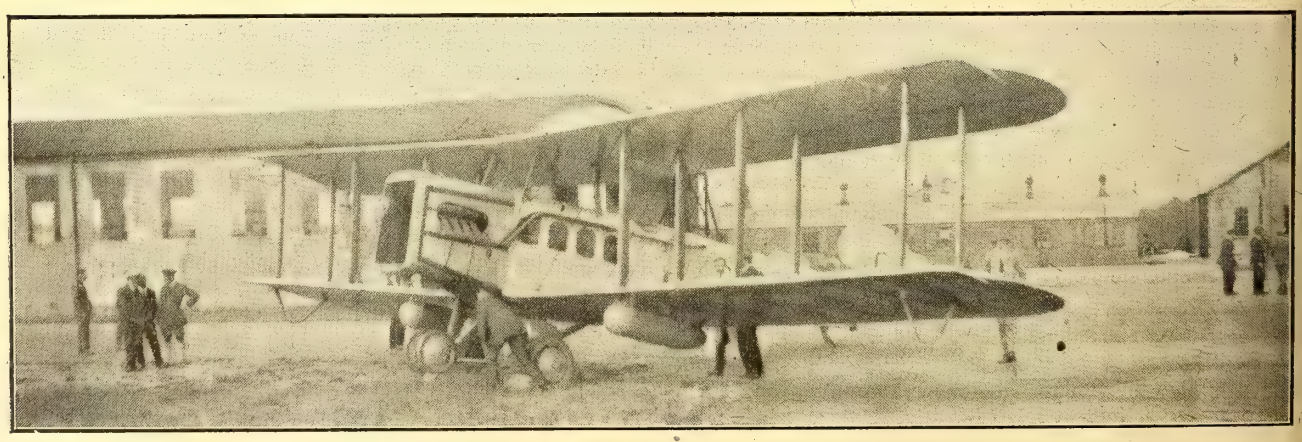
But there is a difference between personal rights and what is right and just. Also there is the other point of view, that of the British taxpayer who desires that money shall be saved in order that there may be more to spend on aviation. That is the point of view from which one has discussed the question. The Safety, Comfort, and Economy of aviation as a whole need consideration at least as much as do those qualities in actual aeroplanes. With which remarks let us proceed to continue the narrative of the Competition—interrupted last week by lack of space. Thus readers may be helped to appreciate to some extent the value of Martlesham Heath to aviation.

THE AIR MINISTRY COMPETITION—*Continued.*

Getting-Off Tests.

Early in the morning on Aug. 12th (Thursday), the Westland and the Avro did their getting-off tests. This is one of the most amusing as well as one of the most valuable of all tests, for it is an exact measure of the ability of each machine to get out of a small field or aerodrome. The figures for any given machine being known there can be no excuse for the pilot who crashes his machine in trying to get out of an impossible position. In fact the official figures ought to be very useful evidence for or against any pilot who killed a passenger through trying to get out of any place.

The tests are made thus: A strip of fabric about three feet wide is set up like a hedge across the aerodrome. It is held



AT MARTLESHAM.—The Westland "Limousine" (Napier engine), the certain winner in the Small Aeroplane Class, running her engine before starting a test.

up by light laths a few feet apart and each fixed by a spring hinge to a heavy foot, so that when the foot is standing on the ground the fabric hedge can easily be pushed down and will spring upright again On the fabric are black vertical lines about three feet apart.

The machines of the small type are allowed a run of 175 yards at this hedge, and of the big type 275 yards. The tests are made only when the wind is less than 5 miles an hour, so as to prevent any machine from scoring through catching a useful gust when just lifting. The result is that the tests generally take place late in the evening or early in the morning.

Some fifty yards in front of the screen a camera is fixed with the centre of the plate bearing on the foot of the centre of the screen where it rests on the ground. The shutter of this camera is worked electrically by an observer standing at the end of the screen. As the machine passes over the screen the observer presses the button and the camera does the rest. The result is a photograph of the front view of the machine when exactly over the screen.

Now, obviously, if the machine is very high up the one-eyed perspective of the camera will make it appear lower than it really was, if the height be measured vertically on the photograph by the height of the screen. Consequently the height is measured by drawing sectors of circles with the centre of the foot of the screen, which is the centre of the plate, as the centre of the circles, and with the vertical lines on the screen as radii. These lines being equi-distant from one another, the space between them on the photograph diminishes, according to their distance from the centre, in the perspective of the camera exactly as does the height of the machine above the ground.

Thus if one of these circles touches the wheels of the machine in the photograph, the distance along the ground from the centre to the line on the screen from which that circle was drawn gives the exact height of the machine above the ground. If the wheels are between two of these circles the difference can be easily calculated. And if the machine does not pass exactly over the centre of the screen a calculation can be made which gives the height nearly enough for practical purposes. In practice few machines clear the screen by a big enough margin to make the calculations more than an inch or so out, and most of them keep very accurately to the centre.

On this particular morning the Westland did very well, passing over the screen at 22.75 ft. from the ground. The Avro being a more heavily loaded machine, failed to get off soon enough to clear the screen, so Capt. Hamersley, to avoid the danger of getting his airscrew mixed up with the fabric, very wisely slewed to the left and ran round the edge of the screen. The official photograph showed the machine just clear of the ground, and the effect was exactly as if she had shied at the jump and run out at the wing, as horses do in "lepping" competitions at horse shows.

The Avro's official height at the end of the 175-yard run was given at 1.18 feet, but this must not be taken as reflecting on the usefulness of the machine. It merely means that she is built for economy, with 240-h.p. for four passengers and pilot, and, therefore, has no power to spare.

Undue Optimism.

According to the original rules, which were unduly optimistic as regards the progress of aviation, competing machines were supposed to get out of the 175-yard circle over "a continuous string or tape" at a height of 50 feet. The "get-off" figures in the table of results show how far ahead of performance this height was in fact. The Judges' Committee realised this before the tests began and the technical officers at Martlesham devised the simple and accurate test described above.

Also the Judges allowed the machines to carry half load of petrol and passengers (or equivalent weight) during the actual tests. Personally one would have liked to see the tests made "dead light," that is to say with no load except the pilot and enough petrol to carry the machine a few miles.

Such a test would be based on the idea that owing to some mishap the pilot was obliged to descend and found that the only field available was one of 175 yards diameter surrounded by 50-foot trees. Such is the idea in the landing tests, which will be described hereafter. Obviously if a pilot landed under such circumstances he would not try to get out of that field with half load. He would find a better field somewhere in the vicinity. He would get out of the little field dead light, after shedding all his load except enough petrol to take him to the other field. And he would fly over to that field to pick up his load again. This is, in fact, about the only criticism which one feels inclined to make about the rules of the Competition, and it is well to remember that the rules were modified by the S.B.A.C. to suit itself.

The Leaping Egg.

Late that evening (Aug. 12th) the Vickers "Vimy" did her get-off tests. Owing to some curious misapprehension she was started from the 175-yard circle intended for the small machines. Captain Cockerell put her at the fence, and to all of us who were watching the performance from the front of the fence (or screen), she seemed to push it over with her bow wheel before getting above the screen.

The official photograph, however, showed her main wheels just clear of the screen with the screen itself upright The observer at the end of the fence confirmed this fact. Therefore she cannot have touched the screen at all, but must have blown it down *forwards* as she was passing over it. The assumption is, therefore, that the great round bow of the Vimy pushes along in front of it a billow of air some feet in depth. This would be quite in accord with theory, for the closing in of this billow on the excellently streamlined fuselage would account for the machine being so much faster with the fat commercial body than with the long, narrow, war-time fuselage.

While the Vimy was performing these entertaining evolutions the Avro was trying her self-controlled test. One of the Judges was on board at the time and noticed that the Vimy was standing on the wrong circle when starting, which could be seen much more easily from the air than on the ground. So when the Avro came down, having refused to fly uncontrolled owing to some lack of adjustment of tail or fin surface, he sent out to tell the Vimy what was the matter. She was then moved to the 275-yard circle and cleared the screen at 26.45 feet from the ground.

Altogether it was a most amusing show to see the "fat porter" leaping into the air like an Easter egg afflicted with the disease which causes a "jumping bean" to jump. When once she was off the ground she flew beautifully and Captain Cockerell handled her as if she had been a light single-seater, never bothering to go far afield to turn back to the starting place, but just banking round the sheds and flying in between them to alight again on the starting line.

The Reliability Test.

Mr. Keep put up a perfectly wonderful performance on the Westland that day (Aug. 12th), for after doing his get-off and self-control flights and his landing glide in the morning —which most pilots would have considered a day's work— he proceeded to do the Reliability Test the rest of the day.

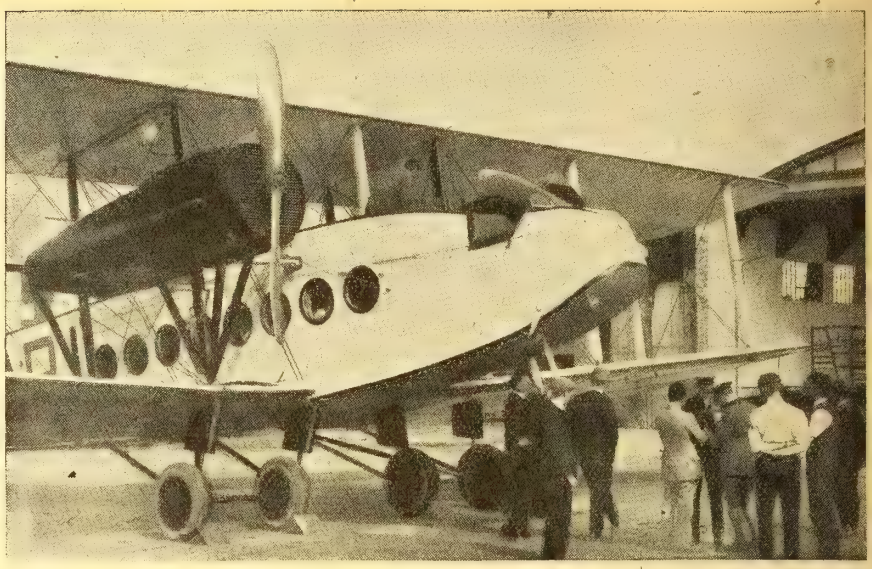
This test consists in loading the machine for a flight of

AT MARTLESHAM.—The Handley Page "W.8" (two Napier Engines) outside the big shed which is capable of housing four or five such machines with wings unfolded.

450 miles (the amount of petrol being estimated on the standard petrol-consumption of the engine), flying for 3½ hours at a speed of not less than 80 miles an hour, landing, filling up with petrol and oil, doing another 3½ hours' flying, and landing again. Two flights of 3½ hours are, in fact, rather harder work than 7 hours straight on end.

Mr. Keep, after all the other tests, did it without turning a hair, and he was not even hard of hearing a moment after landing. Such a performance is not only a high testimony to Mr. Keep's skill and endurance as a pilot, but to the design and construction of the Westland biplane and of the Napier engine, for no pilot could have done as much on a machine which was heavy on her controls or tricky to handle. Nor could he have done so with an engine which needed constant attention.

The machine is weighed when full, before starting, and is weighed again after landing. The difference in weight gives the consumption of petrol, oil and water in 3½ hours. The consumption in the full 7 hours is the G in the W/G formula in the table of results. W is the difference between the total weight when full and the weight of the empty machine, plus the pilot, plus the petrol for 3½ hours, *id est* the useful load. Some idea of Mr. Keep's skill in handling his machine and engine, and in maintaining a perfectly regular cruising speed, may be gained from the fact that the difference between the consumption of his engine in the first 3½ hours and the second was only 4 lb., the higher consumption during the second period being chiefly due, apparently, to the fact that the air was hotter and drier later in the day. Also, this regularity of consumption reflects considerable credit on the engine.



Three-quarter Front View of the Handley Page "W.8" and the housing of her Napier engines.

Deserved Success.

The Napier went through all the tests without giving the slightest trouble. It never failed to start on its own automatic starting apparatus whenever it was asked to do so, and it was never necessary to do so much as clean a plug or tighten a nut. Mr. H. T. Vane has every right to be proud of his firm's products. Very little has been heard of J. R. Rowledge, the firm's designer, yet he has the distinction of having done what nobody else has done, so far as one can recall, namely, of having produced an aero engine of a new type which was right from the start.

The Napier engine, known at first as the "Lion," was not the result of prolonged tests by trial and error, but went straight from the drawing board to the test bench and from the test bench into production. Substantially, the Napier engine to-day is the same as the engine which was refused by the wiseacres of Lord Weir's Department of Aircraft production in 1917 or thereabouts, when they ordered thousands of untested and immature radial air-cooled engines, and colossal unwieldy rotaries. And if to-day, three years later, there is a better engine of its power than the Napier, a great many people in the Aircraft Industry would like to see it.

Some Mishaps.

The Austin "Kestrel," with her 160 h.p. Beardmore, one of the prettiest and most comfortable two-seaters one has seen, was doing the first of the Reliability Tests when a valve broke and the head fell into its cylinder. The valve-head sat up on edge and punched several holes in the cylinder-head, besides battering the top of the piston till it looked like a piece of *nouveau art* metal work (Thank you! It ought to be *nouvel art*, but that is what the shopkeepers call these stained-glass-kidney-and-squirm designs for modern house fittings.).

Why a Beardmore should do such a thing Heaven alone knows, for there is nothing more reliable than a Beardmore. Somebody concerned with the firm said something about one batch of valves having got through by mistake: steel of the wrong tensility, or hardening of the wrong hardness, or something of that sort, so presumably that was it.

Fortunately the stoppage happened while the machine was close over the aerodrome, so Captain Nares merely made one of his usual perfect landings. But the air pressure kept the airscrew turning, and at every suction stroke the damaged cylinder sucked in water from the jacket and squirted it out at every exhaust stroke, with the result that as she came down the machine looked like an amateur fire-engine at work.

The pilot took his troubles very philosophically and spent the next few days waiting for a new cylinder, going up in other people's machines, and pulling other people's legs. Incidentally, never try to pull the leg of the aforementioned Nares. There is no change to be got out of him.

One is glad to hear that during the past week he has put the "Kestrel" through the rest of her tests. She is certainly one of the best of the bunch, and Mr. Kenworthy, her designer, may well be proud of her.

Beardmore's Bad Luck.

The Beardmore biplane (also with a 160 h.p. Beardmore), that interesting experiment by Mr. Tilghman Richards in adapting airship construction to aeroplane design, had, in a way, even worse luck than the Austin. She was only finished just in time for the trials and was sent down from Glasgow without test.

When her engine was run it was found that the radiator, which was *not* built at Beardmore's, refused to radiate. Investigation showed that apparently there was more solder than water space in some parts of it, and that in some clever way there was a passage from the inlet to the outlet through which the water could flow without decreasing in temperature. Which was not good for the engine. As the radiator was built *á la* Hun, namely, into the centre section of the upper plane, it did not improve matters, for it could not be replaced by any standard radiator.

So there the machine had to sit, looking very forlorn, while Mr. Richards, never given to wasting time, jury-rigged a borrowed radiator on top of the passenger's cockpit and tuned up the engine on the ground. It was all extraordinarly hard luck, for so far as the Beardmore part of the job was concerned everything was excellently done. It only proves the old proverb: that if you want a thing well done, do it yourself.

More Reliability.

On that same day (Aug. 12th *was* a busy day) the Bristol (with her 240 h.p. Siddeley "Puma") did her Reliability Tests. Capt. Uwins did the first 3½ hours and Capt. Barnwell, her designer, the second 3½. He has, one believes, the distinction of being to-day the only first class designer who is also habitually a pilot, since Capt. Geoffrey de Havilland has been demobilised by the comic policy of the new owners of the Aircraft Mfg. Co.

Considering that Capt. Barnwell has been flying since 1908 or thereabouts it seems quite unseemly that he should loop and spin for fun as he does. One feels compelled to paraphrase Lewis Carroll and write:—

"You are old, Father William," the young man said,
"And your hair has become somewhat thin,
And yet you incessantly stand on your head;
Do you think at your age you should spin?"

Yet one must own that few pilots loop or spin more neatly than he does on that pretty little Bristol monoplane which is his favourite mount. And he handles big machines just as well, if less frivolously. He landed from his 3½ hours' test in most accomplished style, and taxied in with his tail-stays and skid festooned with Colonel Pretyman's ferns and heather, whereat the irrepressible Nares announced, "Procession of decorated aeroplanes."

(*To be continued.*)

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TABLE OF RESULTS TO AUGUST 23rd.

Machines, Engines and Pilots.	Date of Beginning Trials.	Weighed.	Examina'n.	High and Low Speed.	Reliability (7 hours) and Economy.	Self Controlled Flight.	Stopping of one Engine.	Landing (Glide).	Wind Test.	Landing and Getting Off.
*Central Aircraft Co. "Centaur 4." Two 160 h.p. Beardmores. (F. B. G. Castleman).				H.S. 21/8/20 88 9 m.p.h.				21/8/20		
Handley Page Ltd "W.8." Two 450 h.p. Napiers. (Major Brackley).				H.S. 21/8/20 118.5 m.p.h.	accepted 18/8/20 $\frac{W}{G} = 9.3$			21/8/20		
Vickers Ltd. "Vimy." Two 375 h.p. Rolls-Royce. (Capt. Cockerell). (Capt. Broom).	4/8/20	4/8/20		H.S. 11/8/20 102.73 m.p.h. L.S. 11/8/20 49.63 m.p.h.	accepted 7/8/20 $\frac{W}{G} = 6.33$	11/8/20	Starboard 12/8/20 failed. Port 14/8/20 succeeded	11/8/20		Get off 12/8/20 26.45 ft. Landing 14/8/20 308 yards.
Austin Motor Co., Ltd. 160 h.p. Beardmore. (M. D. Nares).	4/8/20	4/8/20		H.S. 6/8/20 109.96 m.p.h. L.S. 9/8/20 45.1 m.p.h.		5/8/20		5/8/20		Get off 16/8/20 3.8 ft.
W. Beardmore & Co., Ltd. 160 h.p. Beardmore. (G. Powell)	7/8/20	7/8/20								
Bristol Aeroplane Co., Ltd. 240 h.p. Siddeley "Puma." (C. F. Uwins).	3/8/20	3/8/20		H.S. 7/8/20 108.3 m.p.h. L.S. 13/8/20 49.07 m.p.h.	accepted 12/8/20 $\frac{W}{G} = 2.22$	16/8/20		12/8/20		Get off 16/8/20 19 27 ft. Landing 24/8/20 313 5 yards.
Westland Aircraft Works. Limousine. 450 h.p. Napier. (A. S. Keep).	6/8/20	6/8/20		H.S. 13/8/20 117.7 m.p.h. L.S. 13/8/20 46.05 m.p.h.	accepted 12/8/20 $\frac{W}{G} = 8.65$	12/8/20		12/8/20		Get off 12/8/20 22.75 ft. Landing 17/8/20 235 yards
A. V. Roe, Ltd. Triplane. 240 h.p. Siddeley "Puma." (Capt. Hamersley).	3/8/20	3/8/20		H.S. 4/8/20 95.7 m.p.h. L.S. 12/8/20 51.5 m.p.h.	accepted 7/8/20 $\frac{W}{G} = 3.63$			4/8/20		Get off 12/8/20 1.18 ft. Landing 14/8/20 239.1 yards.
Sopwith Aviation Co., Ltd. "Antelope." 180 h.p. Wolseley "Viper." (H. G. Hawker).	3/8/20	3/8/20		H.S. 6/8/20 110.35 m.p.h. L.S. 12/8/20 43 m.p.h.	accepted 4/8/20 $\frac{W}{G} = 4.3$	6/8/20		5/8/20		Get off 13/8/20 23 ft. Landing 14/8/20 187.7 yards.

* The Central Aircraft Co.'s machine is flying *hors concours* as she is unable to hold petrol for 450 miles in the tanks at present fitted.

[NOTE.—The letters $\frac{W}{G}$ in column six of the table above indicate a measure of the efficiency of the machine and engine combined. W = the weight in pounds of useful load (either passengers or goods) carried on the Reliability Test, over and above the pilot (and mechanics, if any) and petrol and oil for $3\frac{1}{2}$ hours' flying—approximately London to or from Paris against any ordinary wind. G = the number of gallons of petrol actually consumed in the course of the two $3\frac{1}{2}$ hour flights, or seven hours' flying in all, at a cruising speed of 80 m.p.h.

Thus $\frac{W}{G}$ represents the weight of useful load carried by one gallon for seven hours at 80 miles an hour. From this figure one can arrive at any other figures of costs desired, such as ton-miles per gallon, or ton-miles per penny. Thus a $\frac{W}{G}$ of 8 would indicate that one gallon would carry 8 lb. to Paris and back in that particular machine, or 16 lb. to Paris only, at 80 m.p.h. Which would mean, at 4s. per gallon for petrol, a cost of 3d. per lb. for fuel alone.—C. G. G.]

AN EXHIBITION AT RIGA.

It is intimated by the Latvian authorities that a Trade Fair will be held at Riga beginning in the last week in September and lasting for five weeks. This Fair will offer to British Manufacturers an opportunity of meeting buyers from all the Baltic States, such as Latvia, Lapland, Esthonia and Finland. Though it is hardly likely that much trade will be done immediately in aircraft, it is at any rate to be hoped that the British Aircraft Industry will make some kind of co-operative show there in view of the fact that all these States already have miniature Air Forces and all of them offer vast opportunities for civil aviation both over land and sea.

If the British Aircraft Industry is not represented it will simply mean that the whole of its potential trade will be left open to the German Aircraft Industry and possibly to enterprising French and Italian firms. Any firm who is interested in the idea of exhibiting at Riga can obtain full particulars from the British and Russian Transport Co., Ltd., 6, Lloyd's Avenue, London, E.C.3.

C. G. G.

SUSSEX AERO CLUB.

If the London Flying Club is to be taken as a model of an Aero Club, then the Sussex Aero Club should be a great success. It may be found to be a serious rival to the other. The ballroom floor is said to be quite as good as the Hammersmith Palais de Danse, and doubtless the company is equally "flighty" on both.

In the prospectus there is not a word about flying from beginning to end, though there appears in that brochure to be every convenience from mixed bathing to mixed metaphors.

Possibly it has more claim to being an Aero Club than the Grahame-White affair, since here there does not seem to be a fence separating the Club from the Aerodrome as at Hendon. However, this may not be so.

It should prove a most pleasant place, where worn-out aviators can spend a pleasant holiday far removed from the sight of an aeroplane, and, as such, owing to its very pleasant situation it is to be recommended.—G. D.

TO PARIS BY AIR.

Adventure has become rare in modern life. French novels, cinema acting, or oysters in June are risky, but there are none of the splendid dangers which encouraged Captain Morgan to remain a pirate or Captain Cook to be killed in Otahaite so that people of to-day should wonder whom his statue represents. Once to travel was to make the great adventure. Highwaymen added charm to the dullest of roads, and innkeepers took what was left. On the high seas privateers and pirates or the king's enemies helped to found the first principles of yacht racing. In foreign lands the heathen tongues and strange customs of more civilised races served to maintain interest in our progenitors.

There is little romance in railway transport or Eric Geddes. We are not all "calculators or oeconomists," and the effort of multiplying ¾d. in railway miles has spoiled many a trip in Metroland—that strange new earth discovered by the Underground.

Hence the grand tour—or the first stage of it—by air attracts the seeker after the lost charms of the past. There are so many possibilities. Mr. Hawker once fell into the sea—the same fortune might, perchance, fall to others humbler in the scale of fame. Some "intrepid airman" came down "out of control" in the demesne of a feudal lord weary of Mincing Lane, and stayed to lunch, but not to marry the only daughter. Others, again, might have the same happy accident. Or so it is thought by those who do not read the tablets of the London-Paris aerial route.

In default of adventure some, like me, wish to dine in Paris, and in order to prove that the service was not one of Dr. Jebb's logical impossibilities, I left Croydon on Aug. 19th by the Instone Vickers-Vimy "City of London," piloted by Mr. Chattaway. The weather was unpleasant with alternate anæmic sunshine and the gloom of drifting clouds. A favouring wind, which would have pleased even Nelson, was the only virtue of the hour.

The tidiness of England is almost oppressive. Its intricacies of park, farm land, woods, rivers, hedges, fences, might have been designed by the imbecile who invented jig-saw puzzles. Everything fits so well—but, then, there is so little room to spare. Despite the war arrangements the lack of arable land is still noticeable in England. A very small proportion of the land is under the plough when one includes with the pastures, the parks and woods still undisturbed by the small holding maniacs.

The line of flight to Paris varies but little from the old road route to France. We passed to the north of Sevenoaks well within sight of the splendours of Knole Park, and to the right of Maidstone, then along a line almost parallel to the Redhill-Ashford stretch of railway line.

From the British coast the French coast could be seen in a brief flash of pale sunshine. As we left the land we drove into drifting clouds, at times isolated from sight of all concrete things. Ships like the models in the Round Pond passed slowly below in the leaden water: inhabitants of a strangely remote world. Our course lay over the Varne light vessel midway across the Channel and to the French coast immediately north of Boulogne.

Turning south we flew towards Abbeville over country not designed as a landing ground. Traversed by dykes, the intervening ground is marshy, rough and entirely uncultivated.

As to Abbeville, "it is cold," as Arthur Young said in 1787, "and disagreeably built; many of the houses of wood." Even to-day his words are true, though much of the wood is that of British Army huts still standing desolately in unkempt surroundings as a survival of the past war.

The tidiness of England is as nothing to that of France. Whereas on this side of the water the fields and enclosures are irregular in shape, following naturally the contours of the ground or the idiosyncracies of the acquisitive owner, in France straight lines predominate. Multitudes of squares and oblongs, richly red, fawn, dark as from rain, or white with the foundation of chalk, cover the earth as far as the eye can see, only relieved by the dark patches of woodland or the creeping spread of a country town, bright with red roofs and grey spires.

The decline of the private park is noticeable. Few of the wide ranges of hunting grounds common before 1789 now remain. The laws of succession and the increase in peasant ownership have assisted to make the country a land of small holdings. The broad lands of the Condés are no more. No longer do duchies and marquisates run widely over the landscape. It is a world of business, and there are few to-day who fail

. . . . . to overlay,
With toil their pleasure.

Ahead of us, beyond the clouds, lay Paris, and as we progressed smoothly and swiftly the country became more heavily wooded and the signs of denser habitation increased. The chateaux grew in size, true to the instincts which brought their builders near the great king at Versailles.

Beauvais, the seat of a Prince Bishop, Pair de France in monarchical days, was passed on the left. Peaceful now, it has few memories of 1472, when the men, women and children joined in defending its walls against Charles the Bold, Duke of Burgundy, then at the zenith of his fame and success. Before that—a century before—it was the centre of the *Jacqueries*, an early form of Bolshevism, when the peasants, weary of work, swept and burnt throughout the countryside. As a reward for misplaced effort the duc d'Orleans, the comte de Foix and the Captal de Buch set fire to the town and roasted successfully such villagers as they were able to enclose within the walls.

The Oise was crossed near Pontoise, where centuries ago Louis IX dreamed first of the Crusades which were to bring him his canonisation and the abiding respect of his people.

The Vickers was running throughout with smooth regularity undisturbed by such bumps as an ungenerous day provided for the Paris aerial route. No train, ship, or car could rival the comfort of the new mode of travel. There is a prejudice among many in the world of aviation against large aeroplanes. They are, it is thought, too reminiscent of the motor omnibus or the lorry, fit only for the heavy handed to fly. But there is little doubt that the most prejudiced of scout pilots would be converted after flying a Vickers-Vimy Commercial. Large though it may be, it is not heavy to fly, and it has no tricks to while away the passing hour and the pilots's life. Well designed and well built, it is ideally suited for the work to which the Instone Air Line have put it.

Two hours and twenty minutes after leaving Croydon we landed at Le Bourget, after a journey devoid of unpleasant incident. The search for adventure had failed and the risks of Paris alone remained. Curiously enough, there is more danger to be found in the drive into Paris than in the entire flight from London. Sanguinary drivers of commercial vehicles lie in wait in the outskirts of the city for the necessary victims to maintain the daily casualty average, and in Paris there are the motorbuses, which, well driven, rarely miss their target, though sometimes their prey lives until the evening happy in the attainment of an accomplished end.

To complete the story, the other risks of Paris also failed. Unharmed and not more penniless than in London (for that would be impossible) we started on the return journey on the following afternoon in weather which was almost untrue, as the sun occasionally shone and we had no rain. The alternation of clouds and sunshine produced the necessary "bumps," but even a penny steamboat on the Thames could beat the Vickers in the attainment of undesired movement.

Three hours later—there was a strong head wind in France—we landed at Croydon. So ended a futile attempt to find trouble.—R. B.

BREAKING IT GENTLY.

From Air Ministry communiqué issued on Aug. 17th:—"Airco 18 GEARI, Aircraft Transport and Travel, left Croydon 1050 for Paris with 6 passengers (including Mr. Owen Moore) and goods; had forced landing."

There are two questions which arise out of the above statement. Who is Mr. Owen Moore and why does his name appear in special distinction in an officially-issued Air Ministry communiqué?

THEY ALSO.

The following letter has been received:—

Sir,—I notice your letter in the *Times*, with which, as a somewhat considerable user of air mail, I cordially agree.

On the other hand, when on tour in Belgium, I met with the following observation, made by almost every business man: "When you send us letters by the air mail you save a day. But how must we manage to use the same service when writing to you?"

So that on the other side of the water they are even less well informed than we are here.

London, Aug. 23rd. (Signed) E. V. QUESTIER.

[It is to be noted that the Belgians are a Teutonic people, closely allied ethnologically to the Anglo-Saxons. Which may account for their similar obtuseness.—Ed.]

CARS AND PETROL.

Basil S. Foster, Ltd., who have set themselves up as the terrestrial section of the air lines now operating, are rapidly becoming known as species of earthly god-parents and Y.M.C.A. (in the military, not necessarily Christian sense). In fact, they hold much the same position to air lines as do Gieves, Ltd., to the Navy. Besides having a garage for cars at the L.T.A., they have now a very comfortable waiting-room with telephone installed, also a ladies' waiting-room.

In addition to providing cars for hire, they supply all the petrol, oil, etc., to all who desire it. Doubtless in time they will also supply spare parts and even whole aeroplanes.—G. D.

"No trouble of any description"

Captain A. S. Keep—pilot of the Westland Commercial Aeroplane competing in the Government trials at Martlesham—telegraphs as follows about the

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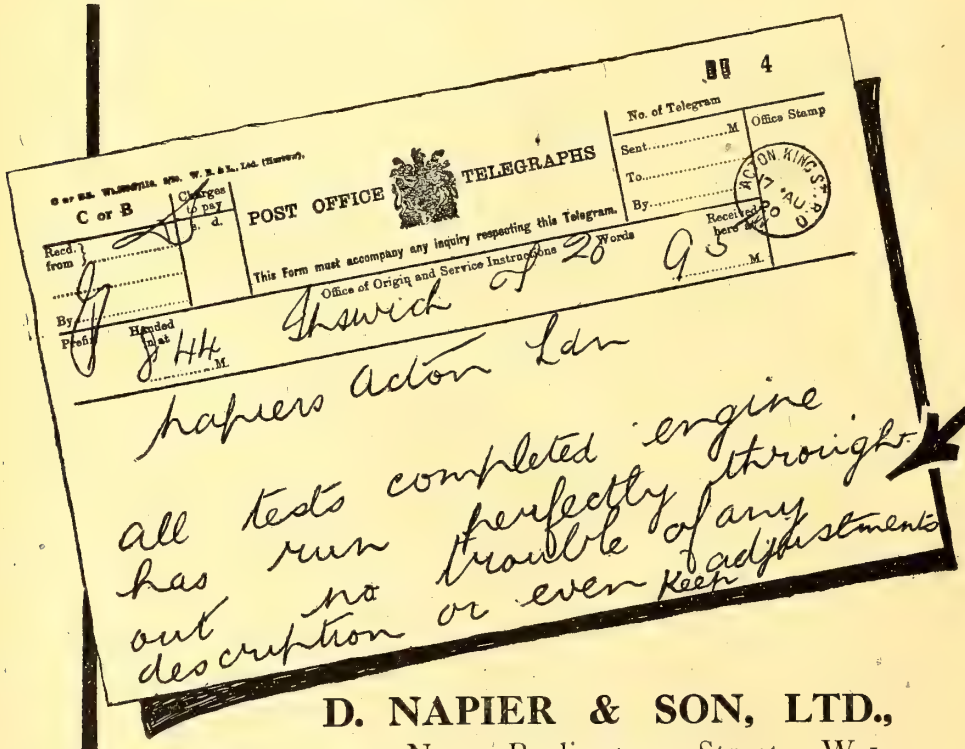

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THE WEEKLY COMMENTARY.

Under the pseudonym of "Navigator" an aeronautical engineer who has been in close touch with the experimental development of air navigation appliances discusses the methods which are now available for air navigation under the various conditions met with in practice.

Some of the many experimental "Albatros" machines which failed to reach the fighting areas are illustrated, and commented upon by Mr. Hildesheim. Many of these machines are of considerable technical interest.

A note on the present state of the aircraft wireless telephone (page 418) presents a view of this question which appears to be more in accord with the facts than certain extreme opinions which have lately been published.

MODERN AIR NAVIGATION PROGRESS.

By "NAVIGATOR."

The subject of air navigation is one of increasing importance in view of the future development of civil, military and commercial aviation all over the world. At the present time, it might be stated that one of the principal causes of the interruption of continuous daily flying is the inability to navigate and land machines in any weather.

During the late war, the fact that our pilots flew in almost any weather was due more to their pluck and endurance than to scientific aid in the form of efficient navigation methods or devices; it is therefore one of the aims of modern navigation methods to relieve the pilot of physical and mental strain by providing him with an efficient navigator (in the case of the larger machines) or the necessary simple instruments and methods in the case of small machines.

TYPES OF AERIAL JOURNEYS.

Confining our attention to the case of heavier-than-air machines, since the conditions are more onerous in this case, although precisely the same remarks apply in the case of airships, it is of interest to analyse the various aeroplane journeys which must be undertaken under commercial, civil and military conditions. These may be roughly grouped under three headings, as follows: namely,

(a) Short and long routine flights, such as regular inter-aerodrome and inter-country flights for commercial and military purposes.

(b) Short flights over unknown country and in random directions, up to about 100 miles from the base.

(c) Long-distance routine flights, and flights in any direction out of sight of land; i.e. above clouds, over water, or at night.

ROUTINE COMMERCIAL FLIGHTS.

As the events of the first year of post-war commercial flying has conclusively shown, it is possible to do routine journeys quite easily, simply by aid of good maps and recognised landmarks, for the same pilots are regularly employed on these trips and quickly become familiar with landmarks and ground objects along their routes; it might be said that in these low altitude flights special instruments are of minor importance under fair weather conditions. This type of journey is termed "pilotage."

The only disadvantage of this method of finding one's way lies in the fact that when the weather suddenly changes, or it becomes misty or foggy, and the ground cannot be seen, the service is interrupted or forced landings have to be made; this has been the experience of several routine services during inclement weather.

LONG DISTANCE ROUTINE FLIGHTS.

For long distance routine flights, the journeys are made in a series of steps, usually not greater than 300 or 400 miles (the same pilots would only fly over the same sections of the route), again by the aid of good maps and well-known landmarks, using more, however, the compass and drift bearing plates.

In view of the fact that an efficient commercial aviation service must be maintained under almost any weather conditions, and remembering fatal accidents in the past due to flights under adverse weather conditions, there is no doubt that more attention must be given to the adoption of reliable navigation methods and instruments, so that in emergencies pilots can employ these to find their way in or above clouds and to land in foggy weather.

USE OF RELIABLE TURN INDICATOR.

It is known for certain that at least three fatal accidents to English pilots last year were due to the fact that no turn indicators were fitted to their machines, and that the compasses fitted were unsuitable as a means of indicating turns.

Most compasses either show an opposite turn at the commencement, or the needle oscillates to either side of the mean position so that in any case the pilot has no definite means for telling him which way his machine has turned, and in most cases his efforts at correcting the turn merely result in increasing it, until the machine gets into a dangerous attitude.

The use of a static head or, better still, a gyroscopic type of turn indicator under these circumstances will almost entirely obviate the above-mentioned effects under all conditions of flying.

GROUND CONDUCTOR DIRECTING DEVICE.

Before leaving the subject of routine flights, reference might be made to two possible future methods for directing and maintaining a regular route, namely, (a) the alternating current ground conductor or leader device, and (b) directional wireless used in conjunction with fixed beacon stations along or at the end of the route.

The former method, which has been successfully used for steering ships through passages in minefields and harbours, consists in laying a cable along the proposed route and passing an alternating current of a given frequency along it. The machine carries an electric conductor in which alternating currents are induced by the ground conductor. By means of a telephonic receiving set it is possible to steer the aeroplane by simply maintaining signals of maximum intensity.

It is also possible to estimate the height of the machine above the ground by indicating or measuring the intensity of the current in the aeroplane's conductor. The frequency of the alternating current would be different for different routes. It is also possible that this method may be adapted so as to enable machines to land in fogs and ground mists by the provision of cables conveying alternating current around and across the aerodrome.

The wireless method will be considered later.

Short Random Flights.

The second type of aerial journey mentioned under heading (b) would correspond to military machine and special errand flights, and in many cases would have to be made above clouds or at high altitudes (under war conditions).

Measurement of Wind Factors.

For this type of journey it will be necessary in the first place to have a good map of the route, upon which is shown a line, or map bearing, corresponding to the shortest distance between the objective and starting point. It will next be necessary to know the strength and direction of the wind at the proposed flying altitude, since these factors progressively change with altitude.

At most important stations, trained meteorologists are available, and by means of pilot balloons and theodolites, or of smoke-shell bursts and Hill mirrors, or the camera obscura, the strength and direction of the wind can be readily obtained at any height.

If no such ground facilities exist, the pilot or navigator can obtain the required information in several ways, by observing with special drift sights or bearing plates the apparent direction along which ground objects appear to move or drift when the machine is headed upon the map compass course, and by noting the time taken for any conspicuous ground objects to cross two fixed sight lines on the drift sight.

Measurement of the wind factors from the machine itself is more difficult at higher altitudes and cannot be relied upon for heights above about 10,000 or 12,000 ft., even on very clear days.

A very simple yet very effective method for flights in random directions is that known as the "two-point" method, and it consists in selecting from the course line on the map two near conspicuous ground objects, one of which is usually the starting point. The distance between them is carefully measured, and also between the objective and starting point.

If now the machine is flown in a straight line from the starting point to the second conspicuous object (which can be readily picked up at the starting point) and the mean compass reading and time-interval between the two conspicuous points be noted, it is an easy matter to maintain this mean compass course (which is thus automatically corrected for drift) and to estimate the time of the journey; the latter quantity bears the same ratio to the time-interval between the two conspicuous objects that the total distance bears to that between the objects. It is, of course, necessary to fly at a constant speed throughout.

This method may be extended, and has actually been used for flying above clouds, by using two smoke-shell bursts at a given distance apart and in a line with the objective.

For night flying two conspicuous lights or searchlight beams would be employed. Successful results have been obtained over distances up to 100 miles or more by this method.

Course and Distance Indicators.

For the ordinary drift calculations it is necessary to know any four of the following six quantities, namely, (1) the wind speed; (2) its direction; (3) the machine's speed; (4) its course or compass direction; (5) the ground speed, and (6) the ground or map direction; the other two can be computed from the triangle of velocities.

Simple devices known as bearing plates, or course-and-distance indicators, depending in principle upon the mechanical solution of the triangle of velocities, are now available for this purpose, and their use saves much mental fatigue in estimating results in the air.

It is possible with such instruments to correct for small changes of wind speed and course along the route.

There are, however, one or two important points to consider in working out courses, bearings and times, namely, (1) that the ordinary air-speed meter of the Pitot-head type requires correction for altitude, or, more correctly, air density, so that the machine's speed as read is under-estimated, roughly, by about 1½ per cent. per 1,000 ft. altitude; (2) that the map course must be corrected for magnetic variation (which is about 14½ deg. W. at London) and the deviation of the compass (usually about 4 or 5 deg. maximum).

Dead Reckoning.

The above method is that known as Dead Reckoning (or D.R.) and is commonly employed for random flights or in cases in which better methods are not available or require checking.

Long Distance Navigation.

Undoubtedly the most important air navigation question at the present moment, and one upon which much research and attention is being lavished, is that relating to long distance navigation out of sight of land.

It has already been shown that with the land in sight, and given suitable flying and navigation instruments, it is possible to make journeys in short flight steps with considerably reduced risks, but of longer duration. An excellent example of the application of the method is to be had in the case of the newly inaugurated 2,600 miles route, by the Handley Page Company, from Pernambuco in South America to Buenos Aires.

This course is split up into seven stages, varying in length from 125 to 325 miles, with suitable aerodromes at the end of each step. This journey will occupy a period of three days, but with special night-flying arrangements it will be possible to reduce this period to one-day-and-a-half; the ordinary journey by mail boat occupies about nine days. One advantage of this method is that machines need not fly very heavily loaded with fuel, oil and spares, and so can carry greater cargoes.

Navigation Arrangements on Large Machines.

Turning next to the more difficult question of navigating machines over clouds and water, or at night, it is of course highly probable that only large machines will attempt such flights, so that proper accommodation will be available for the navigating officer, in the form of a cabin or compartment wherein he can compute his results, lay and plot his course, keep his log, etc.

A wireless installation for sending and receiving will also be included in the general equipment of the aircraft, and there is now little doubt that a receiving directional wireless set will be included, and in some cases a directional transmitter.

The arrangements made for the navigator will enable him to obtain a clear view downwards, rearwards, over the side, and an unobstructed view of the celestial sphere for astronomical observations. The navigator must also be able to communicate instructions to the pilot with ease.

Methods of Long Distance Navigation.

The three principal methods capable of being employed for navigation purposes on long flights out of land are as follows: —(1) Dead Reckoning; (2) Directional Wireless, and (3) Astronomical Methods.

Long Distance Dead Reckoning.

The first method, as previously explained, consists in setting the course prior to starting, making due allowance for the wind strength and velocity, compass deviation, magnetic variation, effect of density on Pitot head readings, etc. By means of bearing plates the drift of the machine can be checked from time to time by sighting on fixed ground objects, say, every 40 to 60 minutes, and the course corrected accordingly.

For over-sea navigation, smoke bombs which ignite on reaching the water are used as fixed points on which to take sights with the drift apparatus, and some indications may be had from passing ships, the smoke from their funnels, directions of their pennants, etc.

Dead reckoned positions are, of course, plotted on a chart, and the machine's course altered to suit. At the best, however, the dead reckoning method is only very approximate, and in view of the known changes in the wind components over long distances, it may lead to some rather unreliable results.

This was shown in the case of the U.S. N.C.4 flying boat, which on her way to the Azores flew in foggy weather for about 170 miles and had to rely entirely upon D.R. estimates. When the true position was eventually found, the machine was 45 miles, or about 15 deg., out of her course.

In the case of the Transatlantic Sopwith machine, which employed D.R. methods for the 900 miles' run, it was found that the machine was 145 miles, or about 9½ deg., out of the correct track. The D.R. method should therefore only be looked upon as a useful makeshift, in the absence of better means.

Wireless Methods.

Wireless and directional wireless methods provide a very valuable means for navigating machines over long distances, and although still in the experimental stage the results at present obtained appear rather promising.

The two principle methods employed consist of (a) Directional wireless, with the receiving apparatus on the machine, and known fixed ground beacon stations, and (b) directional wireless with the receiving apparatus at known ground stations, signals being transmitted from the machine itself.

Ground Directional Stations.

For military purposes the second method (which incidentally was used by the Zeppelins during their raids, and often led to their undoing) is not to be recommended, as the machine gives away its own position.

In this method the machine sends out wireless signals of a certain wave-length, and two or more fixed direction-finding stations receive these signals. By making the receiving circuit in the form of plane loops, capable of rotation about a vertical

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axis, and employing the methods of least, or maximum, signal intensity, the station can determine very accurately and quickly the direction of the aircraft.

It is only necessary to employ two stations, with perhaps a third as a check or central station, and the exact chart position of the aircraft can be readily determined from the "cut" of the two or three bearing lines; this position is signalled (by wireless) back to the machine.

The advantages of this system are that there is no limit to the size or accuracy of the ground station apparatus, and that it can be employed for ranges of many hundreds of miles in conjunction with fairly low-powered transmitting apparatus on the machine; moreover it avoids the inaccuracies due to quadrantal errors in the other system.

Its use would probably be limited in cases where large numbers of machines were signalling, or when ships were also using the system, as one signal at a time would usually only be dealt with by the receiving station.

Directional Apparatus in the Machine.

In the first method mentioned, the vertically rotating loops are fixed to a frame in the machine itself, and a large annular scale reading in degrees is provided in order to indicate the direction of the signals received from known fixed ground sending stations. It is, of course, necessary for each ground or "beacon" wireless station to send out waves of a pre-arranged frequency, so that the station may be recognised. As the size of the direction-finding apparatus is limited by the fuselage dimensions, the accuracy is also limited, but already it has been shown possible to take readings from high power stations over distances of 2,000 miles, and to obtain bearing lines true to within a mean angle of about 1½ deg. for distances of a few hundred miles, although occasionally unexpected variations giving greater inaccuracy occur. With two beacon stations a fix can, of course, be obtained.

Already there exist stations, such as Poldhu (Cornwall), Paris (France), Nauen (Berlin), etc., which are being employed for this purpose. With the institution of a number of new wireless beacon stations this directional wireless method may prove of increasing utility. It should be mentioned in passing that the direction angles obtained by the above method require correction for the quadrantal error of the machine, which originates in a similar manner to the compass deviation errors. For long distance work, using ordinary charts, an allowance must also be made for the fact that the wireless waves follow great circle lines, and not straight lines on the map.

Another successful method employed for long routine flights over any distance is that in which there is a wireless beacon station at the objective, sending out signals of a given wavelength, and in which the machine is fitted with wing coils for receiving the signals. When the machine is directly headed for the beacon the two wing coils either combine to give a maximum or a minimum note in a telephonic receiver, and the direction of the machine is regulated so as to maintain this note. The position of ships passed over can also be obtained by wireless signalling, and the information obtained used for checking the position of the aircraft.

Astronomical Methods.

The third available method is the same in principle as that employed in marine navigation, and consists in measuring the altitudes of heavenly bodies and noting the chronometer times of the readings; by the aid of special tables, curves, or computing instruments, one or more bearing lines can be drawn on the chart, and if two such bearing lines be obtained (from the simultaneous readings of two celestial objects) the position can be fixed on the chart.

This method when applied to an aircraft introduces several problems connected with the natural angular motions and acceleration of the machine itself, the disturbing influences of bumps and gusts, etc., and the evolution of special compact tables of the astronomical elements.

The sextants employed for measuring the altitudes of the celestial objects require artificial horizons, as although occasionally cloud horizons may be obtained, these are not very reliable. Already fairly satisfactory instruments have been evolved which employ either a circular spirit level or gyroscopes for giving the relative horizontal plane, and altitudes can now be measured to within about 8 min. of arc, or less.

Having obtained the altitudes and hour angles of the bodies observed, the next problem is that of utilising the results, and here again much ingenuity has been brought into play in the evolution of special mechanical devices for solving spherical triangles, spherical triangle solution charts, air tables, etc.

From the result of the observation of one body a position line can be drawn on the principle depending upon Sumner's method, using as a first means the D.R. position. If two such lines be obtained from two bodies which do not cut too acutely, a good "fix" can be obtained.

In the daytime only the sun can usually be obtained, but sometimes the moon can also be seen, and a fix thus obtained. At night there is a very large number of fixed stars available, and by reducing the number of the stars to first magnitude ones, or to the Pole Star (the altitude of which at once gives the approximate latitude of the place of observation), Vega, Capella, Regulus, and one or two others, for the N. hemisphere, very compact star tables for air use can be employed.

For night navigation, more especially over water, at high altitudes and above clouds the astronomical methods offer the only reliable solution for flight in random directions; moreover, these methods have stood the test of time in marine work and require very little apparatus.

For routine night flying work, no doubt the method of high candle-powered aerial lighthouses, each with its own system of flashes, will be more widely employed; this method, which provides fixed recognisable landmarks, was successfully used in the late war for directing our machines home after night raids.

In conclusion, it must be urged that a considerable amount of research and air-experimental test work is necessary in order to develop and perfect the methods above outlined, so that the future navigator will not require to be such a highly-trained scientist and astronomer as the present conditions appear to necessitate.

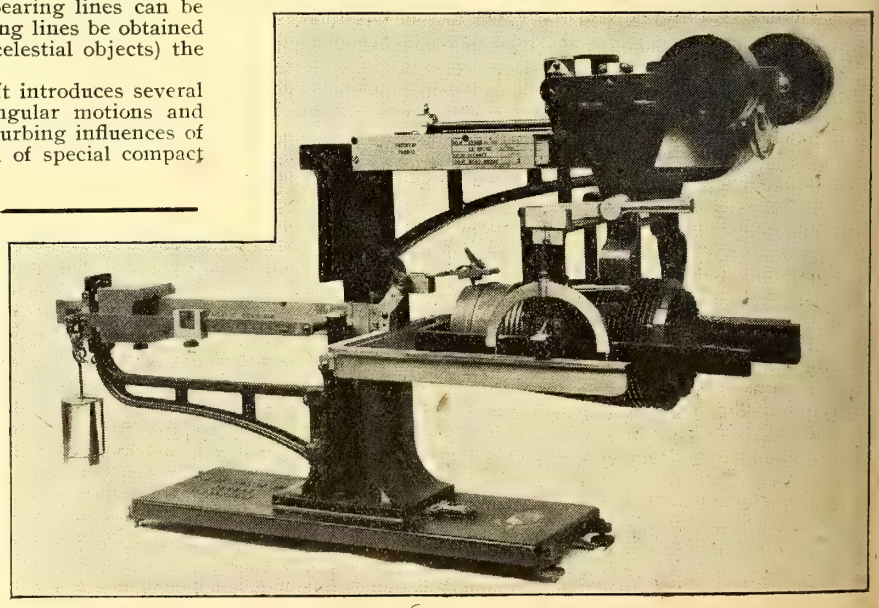
By the simplification of the apparatus and methods the field of useful navigating officers will be considerably increased and commercial and military flying rendered much safer and more reliable.

It is practically certain, however, that the future aerial navigator will require to be a specially trained man, preferably also a pilot, with a close knowledge of the several alternative methods previously outlined, so that he can cope with emergencies.

AN ORNITHOPTER.

According to the *Daily Mail*, M. Passat, who will be remembered in connection with his experiments with ornithopters some years before the war, is still developing in that line at Raynes Park. One would imagine that after all these years' experimenting, M. Passat must have obtained a considerable amount of useful data.

According to a *Daily Mail* reporter, the machine is now fitted with a 10-12 h.p. engine, and "even in the 12-yards-square garden it strained at the leash and bounded excitably from the ground."—G. D.



FROM THE A.I.D. EXHIBIT AT OLYMPIA.—A weighing machine for the cylinders of rotary engines. Not merely does it weigh the cylinders, but it indicates that the cylinders are in correct balance, and it is fitted with fixtures, and is calibrated, for the cylinders of all the types of rotary engine which were in use during the war.

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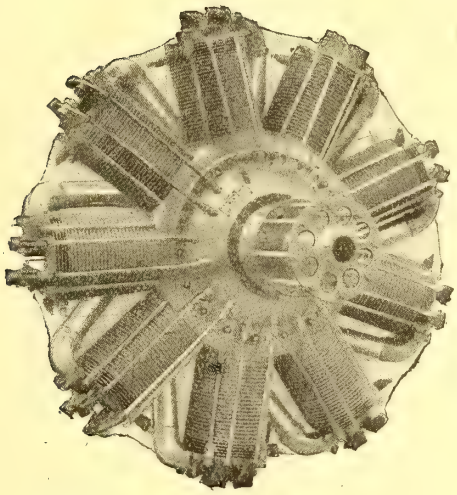

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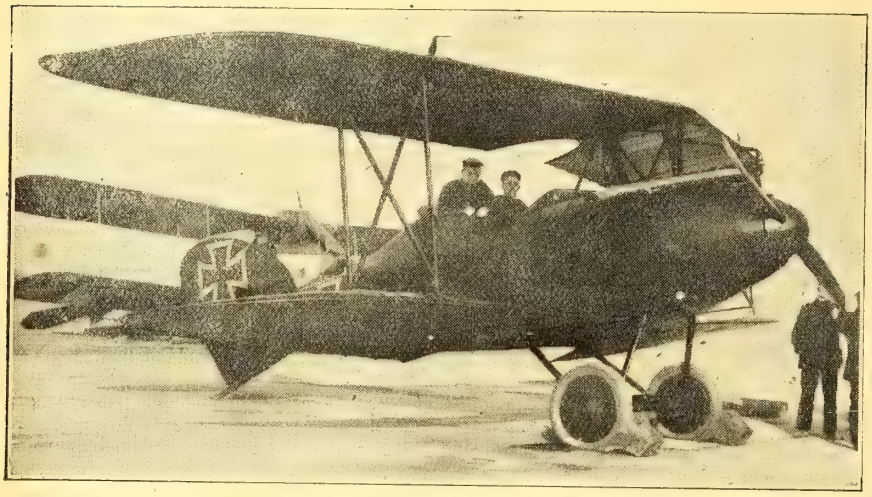
ALBATROS AIRCRAFT.

By ERIK HILDESHEIM.



The Albatros L.23, used by von Richthofen as a transport craft. The very heavy sweep-back of the upper wing and the curious and apparently unnecessary cross-strut arrangement between the wings are noteworthy. Designed for the Army C Class (general purpose two-seater) this type was not adopted for service, and one of the three specimens built was presented to von Richthofen by the builders. A flight on it is described in his book, "The Red Air-Fighter."

The Albatros Company for aeroplane enterprise held during the war a similar position to that of the Sopwith or Aircraft Manufacturing Company on the opposing side inasmuch as the former produced a large number of different models, its activities being limited to no special type and its machines of all classes being turned out by many subcontractors.

One cannot describe here every Albatros war aircraft, as many specimens showed only minor variations and are of little interest. The better-known types have already been dealt with in official reports and elsewhere. The following is then a collection of some of the more interesting types which justify giving their illustrations and comments upon their special features. The letter L, accompanied by a figure, is the private mark of the Albatros Company.

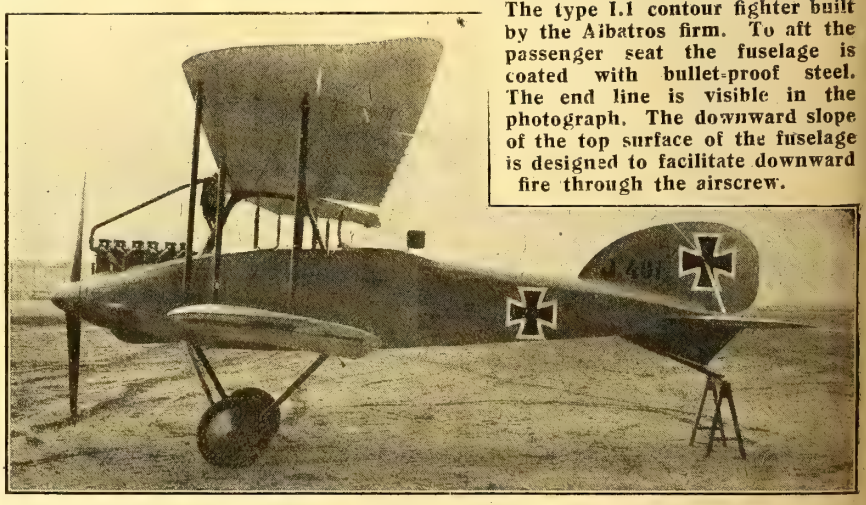
Of the four seaplanes illustrated, the twin-engined pusher (W.3) (W. standing for Wasserflugzeug = seaplane) is equipped with 150 h.p. Benz engines and was built by the Albatros plant at Friedrichshagen. The cockpits of both pilot and observer are in the nose of the central fuselage in front of the planes.

The next Albatros seaplane W.4 shows that their well-known monocoque scout was adapted for naval single-seater work also. The floats had a combined capacity of 2,200 litres. The W.8 can be seen to be a late war product as its power plant is the 8-cylinder Vee type Benz 195 h.p. engine, which was not built before 1918. The struts are apparently entirely of tubes and the front interplane set and those of the landing gear are circular with added fairings. The rudder is balanced below the tapered body, and the single fixed tailplane is mounted on top of the fin with the obvious object of improving the rear fire range of the gunner.

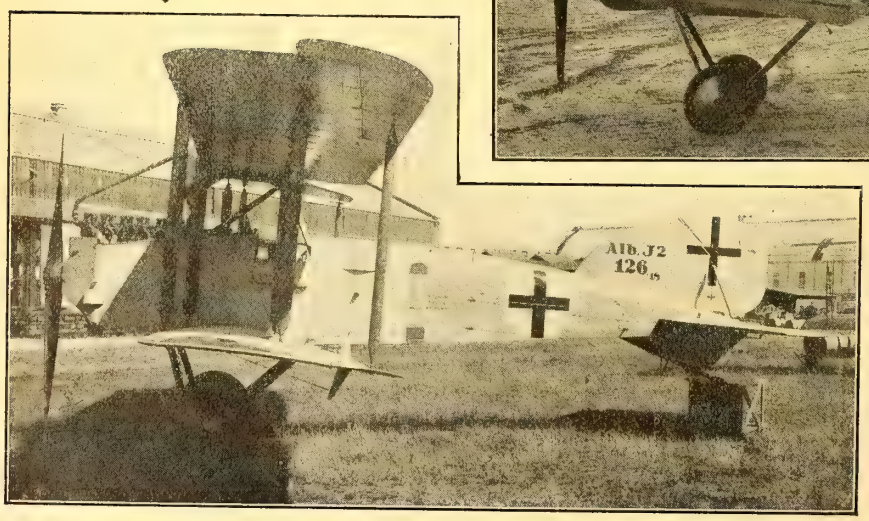
The 3-seater sea-monoplane W.10 was not completed in time for the war. The observers sit in tandem at the front of the hull, which is fitted with side support floats.

The rudder is made in one piece of aluminium and the wooden fixed tail-plane and fin are made in one part and detachable. The 120 h.p. Mercédès engine is encowled together with the car-type radiator on top of the divided planes, resting on two struts. Of the land-going Albatros aircraft an early single-seater from 1915 is of interest, as this rigid truss wing scout equipped with a 160-h.p. Mercédès and the then favourite combined water tank and radiator above the engine shows that new ideas were not always taken to quickly even in Germany.

Amongst the further Albatros scout efforts are two contributions belonging to the triplane period, viz., the L.36 and L.37, equipped with a 160-h.p. Mercédès and 195-h.p. Benz, respectively, neither of which entered the production stage. In the former the strut arrangement will be noted, while in the latter the twin radiators mounted directly on the middle planes are a feature. The Albatros L.23 (or C.9 Army marking) is another product which was not turned out in series, three specimens being in fact built, one of which was presented by the company to Baron von Richthofen, who used it on active service as his private means of travel. The pronounced Vee of the top wings, the additional tail skid fin



The type I.1 contour fighter built by the Albatros firm. To aft the passenger seat the fuselage is coated with bullet-proof steel. The end line is visible in the photograph. The downward slope of the top surface of the fuselage is designed to facilitate downward fire through the airscrew.



The I.2 contour fighter built in 1918. It varies appreciably from its predecessor of the same class. Like the I.1, it is equipped with a 230-h.p. Benz engine and is armour-plated. It appears that it is fitted with guns firing downward through the bottom of the fuselage.

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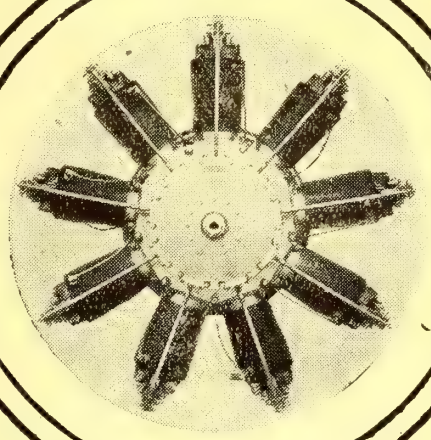

The Engine illustrated is the DRAGONFLY—340 h.p —9 cyl. (Static Radial).

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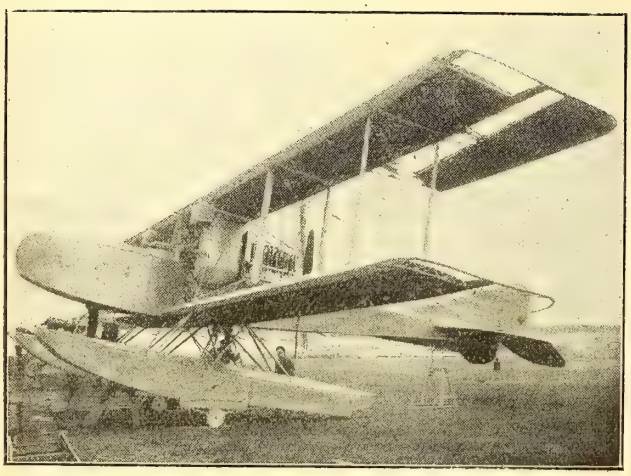
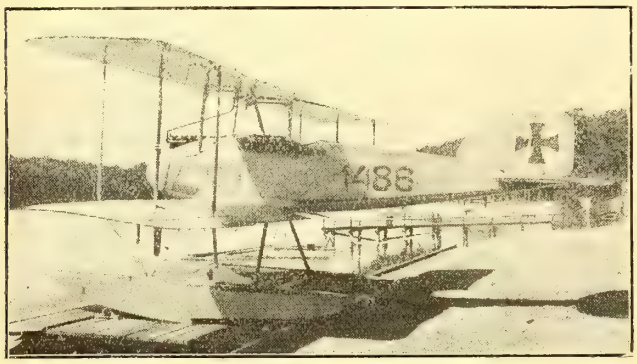
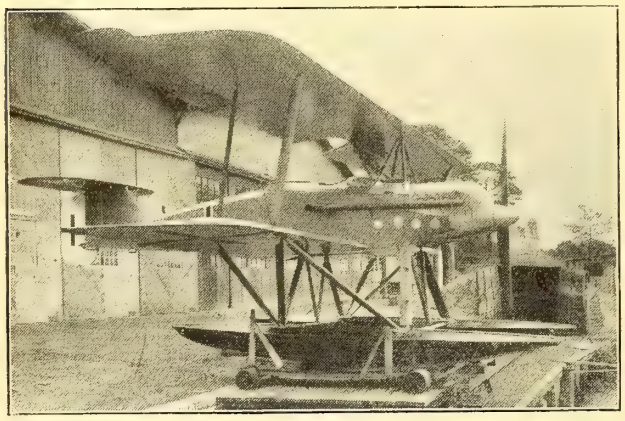
SOME ALBATROS AIRCRAFT.



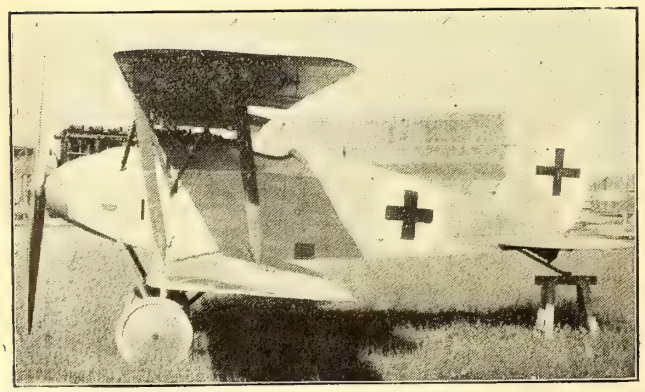
The Albatros W.3 Seaplane (two 150-h.p. Benz engines).



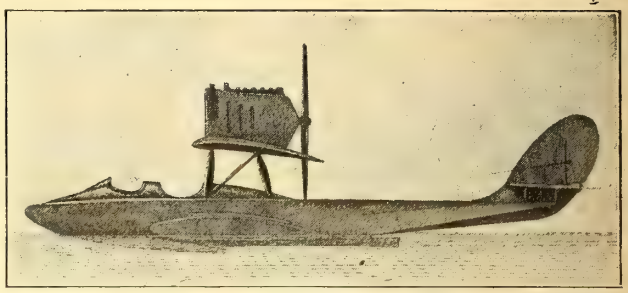
The W.4 Seaplane (180-h.p. Mercédès).



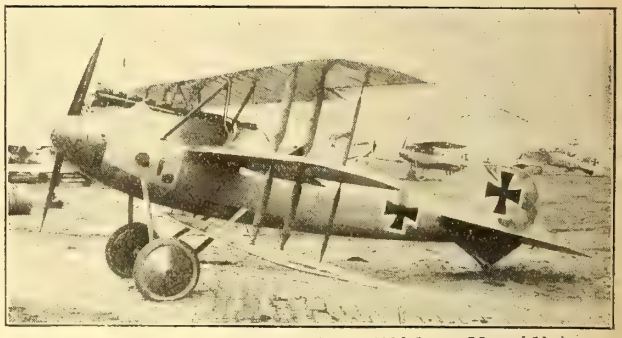
The Albatros W.8 fitted with the 195-h.p. eight-cylinder Benz.



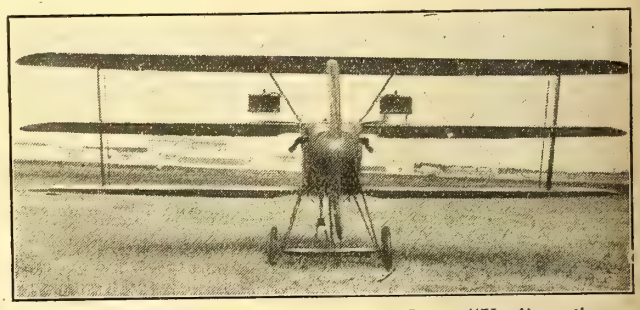
The Albatros D.XII (160-h.p. Mercédès) fitted with pneumatic undercarriage.



The Albatros W.10 Sea Monoplane, obviously of Dornier inspiration.

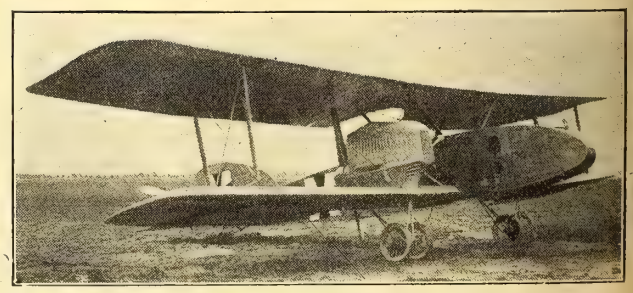


The Albatros L.36 Triplane (180-h.p. Mercédès).



The L.37 Triplane with the 195-h.p. Benz "Vee" engine.

The L.9, a wireless scout of 1915.



The Albatros twin-engine bomber L.21 (two 230-h.p. Benz engines).

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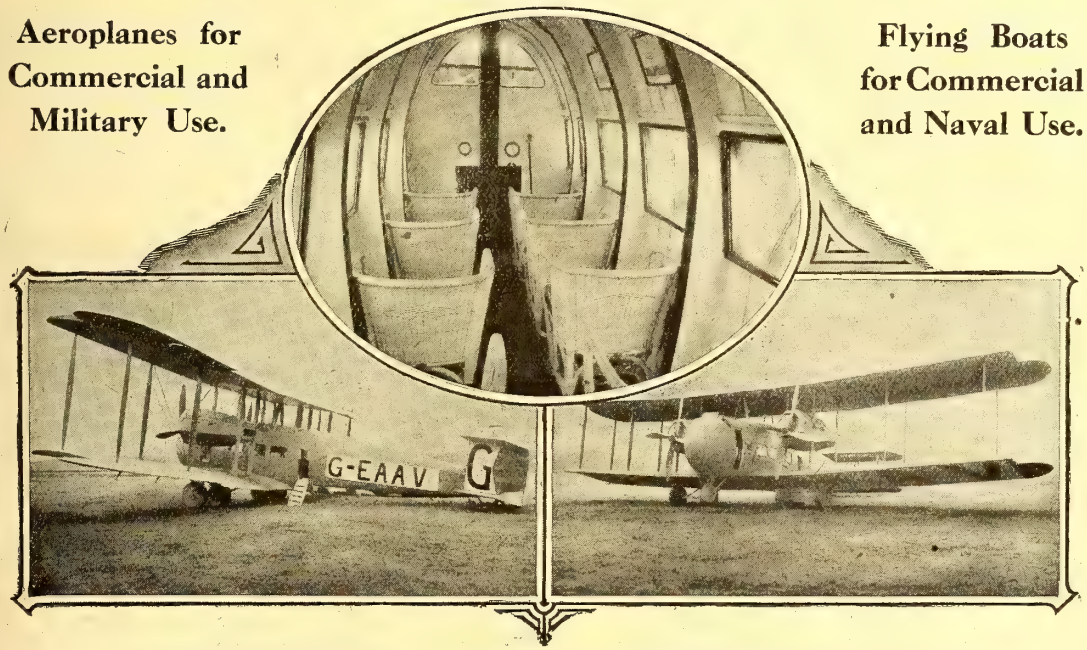

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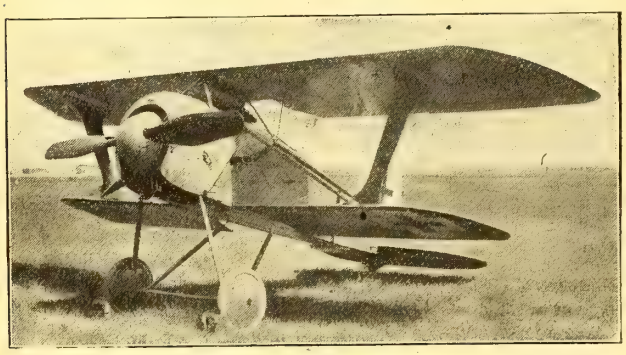
and the single strut row arrangement will be noted, the latter including cross connections at top and bottom as well as cross struts replacing incidence and stagger wires.

This arrangement is found again in the only Albatros twin-engined bomber of the G class known, viz., the pusher biplane L.21, powered by two 230-h.p. Benz engines. This looks cleaner than most contemporaries in Germany. The fuselage and tail unit follow the ordinary Albatros outlines and the nose was sometimes provided with buffer wheels, but it is known that owing to official controversies concerning detail work the type was never built in large quantities.

Two Albatros aircraft, of which nothing has been illustrated or heard so far, are the two two-seaters of the I. (infantry)



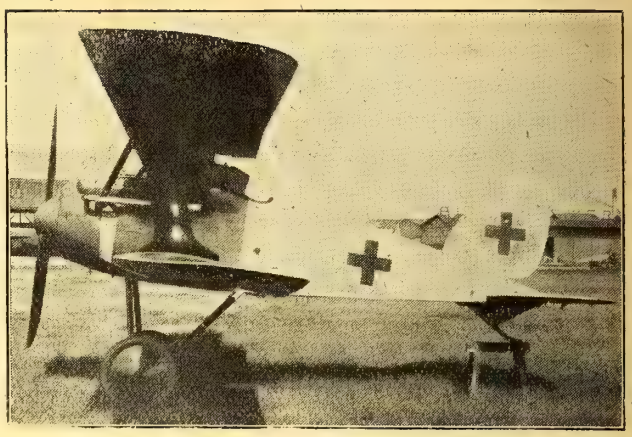
The D.X Scout with the Siemens rotary (160 h.p).

class for contour fighting, viz., the I. I. and II., which can be distinguished by the shape of the fuselage, designed for firing downward and forward.

From the long line of Albatros single-seaters the last scout efforts are illustrated.

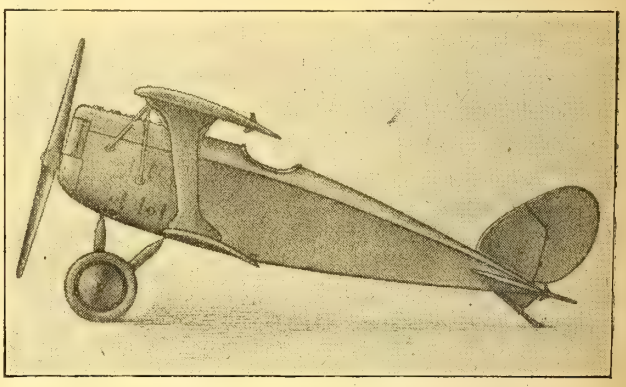
These are, in chronological order, the D.X. with the T struts which shows the first appearance of the 195-h.p. Benz 8-cylinder V engine, the wireless 160-h.p. Siemens rotary engined D.XI. (or L.41) of similar outlines, which, built in 1918, did not get used before the armistice.

The D.XII. appeared simultaneously and returned to the 160-h.p. Mercédès for its power plant. It was fitted with the Boehm pneumatic springing to the undercarriage which accounts for the third undercarriage strut.

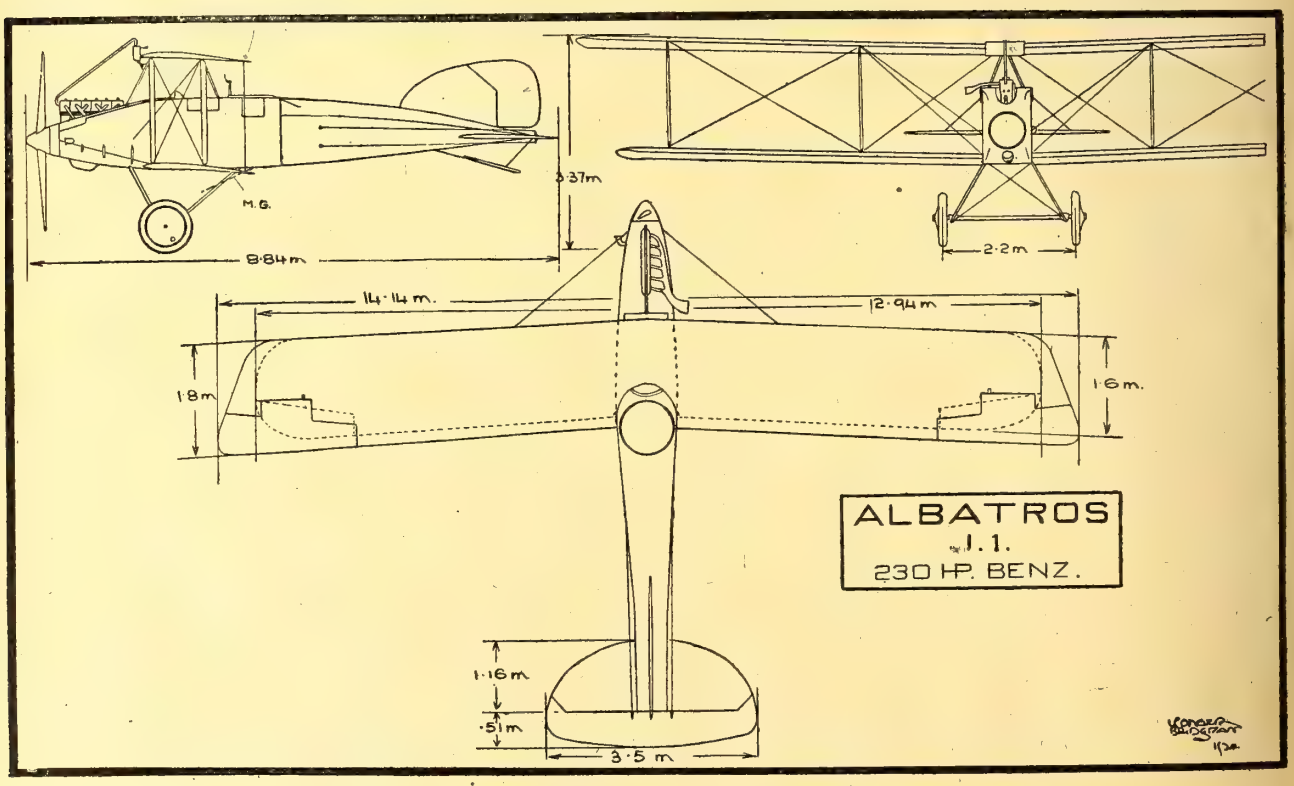


The D.XI Scout with the Benz eight-cylinder "Vee" engine.

A contemporary 230-h.p. Benz-engined two-seater version of this type was built as the last outcome in that line. The final D. XIII. and XIV. scouts, with Teves and Braun car-type radiators, varying mainly in the deepness of the single interplane struts and in the power plant, being respectively a 160-h.p. Mercédès and a 185-h.p. B.M.W. engine.



General Sketch of the D.XIII. Scout.



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WIRELESS TELEPHONY IN AEROPLANES

By Oliver Ceans.

One of the most curious facts connected with post-war developments in aviation is the apparent cessation of progress towards the evolution of a satisfactory wireless telephone set for aeroplane use. This is all the more surprising when it is recalled that, for some considerable time prior to the armistice, wireless telephony sets were being used with marked success at numerous stations at home and abroad.

These instruments were extremely useful during the war in facilitating formation flying, patrol work, landing arrangements, etc. They were, of course, subject to failure at times; so were the machines that carried them. But they certainly served a much more useful purpose than might be gleaned from the unconvincing statements of a contemporary writer who chooses to call himself "Electron" and who would have us believe that the best telephony instrument yet made is only fit for the nursery.

Such an opinion hardly needs refutation. It is sufficiently absurd to condemn itself. Nor was it more effectively condemned by the frantic denial of a certain well-meaning but inexperienced critic, who rushed to the other extreme and sadly anachronatised by ascribing a degree of perfection to present-day telephone appliances which it will take years to achieve.

The real truth lies about midway between these two extremes of prejudiced pessimism and obtuse optimism. On the one hand no statement could be more flagrantly inaccurate than that which condemns all existing telephone instruments as useless and unreliable. On the other hand, nothing could be more misleading than the puerile and pitiful piffle of the cheerful critic whose rhapsodical ravings suggest that the Marconi Company have solved everything that is to be solved in connection with wireless telephony for aeroplanes.

War-time wireless telephony sets were not highly efficient instruments. But they rendered considerable assistance in a limited sphere of application. Present-day instruments are *not* highly efficient, but they represent a slight improvement on all previous models. That is the only correct statement of the case.

The real cause of the recent lull in development springs from circumstances totally different from those which "Electron" discusses in such voluble terms. The simple truth is that the subject of aircraft telephony is only now *beginning* to present itself as a paying proposition to commercial aviation firms. Hitherto, there was no room for it among the numerous problems that have choked the growth of the industry as a whole.

No future History of England will be complete without a special chapter on "The Amazing Apathy of Bleary-eyed Britishers towards the Advantages of Aviation as a Commercial Concern." If such a chapter were well done, it might deal fittingly with those "problems" which have resulted in so much ink-spilling, by including a short foot-note—as follows:

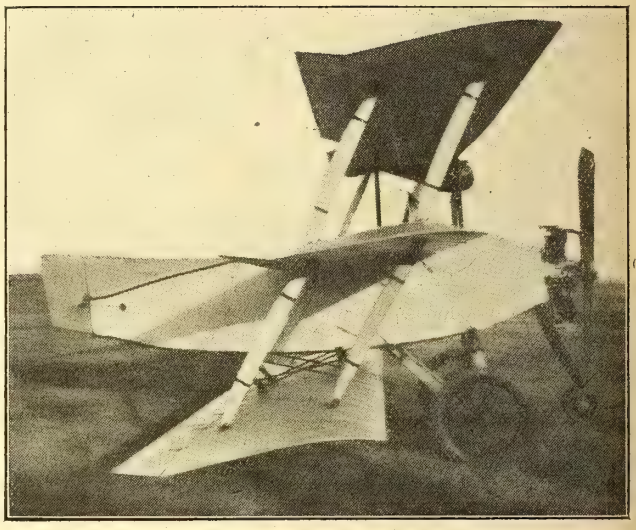
"Owing to the numerous obstructions related above, which were carefully strewn in the path of Civil Aviation at the close of the Great War, the question of aircraft telephony for commercial purposes was compelled to take a back seat during the two years taken to scrape the mud out of the eyes of British Business Men." That will be quite sufficient to explain the whole "problem."

Commercial firms are fully alive to the advantages to be derived from the employment of wireless telephonic equipment on their machines. They also know the exact relation of this subject to the larger problems with which they have been bravely contending during the past two years in their efforts to keep afloat.

To-day, they are giving their best attention to this particular branch of aerial equipment. Within the next few months it is expected that the Radio Communication Company (almost completely composed of ex-officers and men of the R.A.F.) will bring forward an aircraft telephone set that will surpass in efficiency any similar instrument yet produced.

Meantime, there is nothing to be gained by heeding the distorted drivel of the prejudiced and the obtuse.

ANOTHER ITALIAN TRIPLANE.



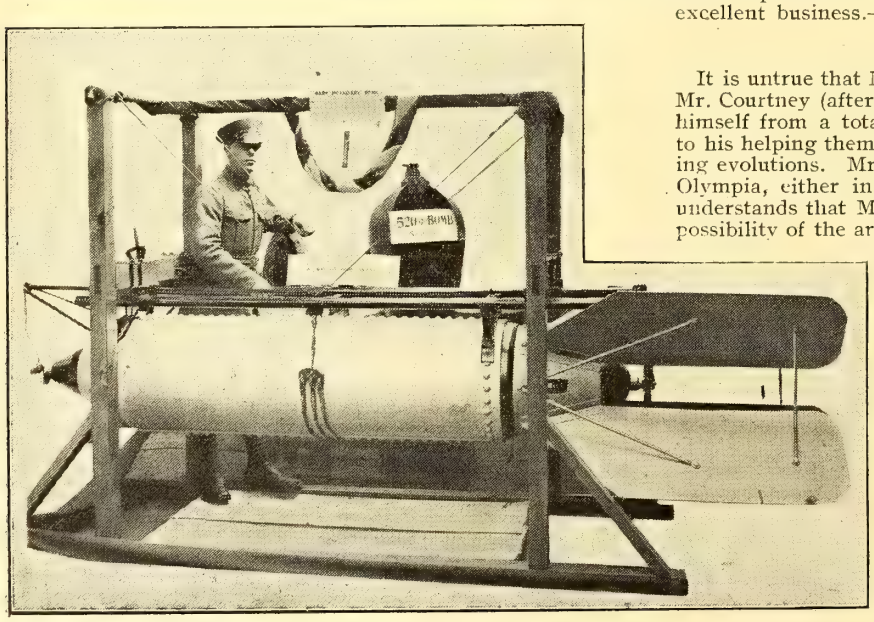
The Sarri Triplane.

A photograph of the Sarri triplane which, being of the same proportions as the other two triplanes taking part in the Taliedo 6 metre trials, had entered, but was not quite ready for the same, is to hand. Of more daring stagger and somewhat unconventional design (as regards the tail organs) and rig (as regards the wing construction and staying), the machine is waiting the now postponed International Small Machine "Mapelli" Cup to show forth its merits. The date of the postponed race in which several foreign entries are announced is Oct. 3rd, a more suitable date in every way.

The race is for machines with not more than 6 metres span and 4,585 c. cm. cylinder outsweep capacity, and the entrance fee is the miserable one of 500 Italian lire, some £7, which should be sent to *Gazetta dell'Aviazione*, Via Torino 10, Milan. I shall be glad to assist *bona fide* British firms who want further particulars. Machines with good motors should do excellent business.—T. S. H.

A DENIAL.

It is untrue that Messrs. Maskelyne and Devant approached Mr. Courtney (after his marvellous performance in extricating himself from a totally inverted "Semiquaver") with a view to his helping them in some of their extricating and excruciating evolutions. Mr. Courtney, however, may be seen later at Olympia, either in a circus or the next Aero Show. One understands that M. Houdini is somewhat discouraged by the possibility of the arrival of a rival.—G. D.



FROM THE AIR MINISTRY EXHIBIT AT OLYMPIA.—Bombs in all sizes. The miniature object suspended from the centre of the framing is a "Baby" incendiary of 6½ oz. weight. Under the elbow of the airman is the nose of a 220-pounder, to the right a 520 lb. in section, and recumbent the 1,900-lb. type designed for the German nights' entertainments of Christmas, 1918.

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THE IMPERIAL COLLEGE AND RESEARCH.

In connection with the scheme proposed by the Committee on Education and Research in Aeronautics in their report dated Dec. 12th, 1919, a Department of Aeronautics has been formed at the Imperial College, South Kensington. Sir Richard Glazebrook is director of the new department. This movement was initiated by Sir Basil Zaharoff's endowment of the University of London Chair of Aviation to which Sir Richard Glazebrook was appointed.

The school is administered by an advisory committee, with Sir Arthur Acland, representing the College, as chairman. The Air Ministry, the Aeronautical Research Committee, the Royal Aeronautical Society, the Society of British Aircraft Constructors, and the University of Cambridge are represented on the committee.

A comprehensive scheme of instruction and training, mainly post-graduate in character, has been arranged for next session, beginning in October, including special sections in aeronautical engineering, meteorology, and navigation, and with the co-operation of the Air Ministry the services have been engaged of a distinguished staff of experts. Apart from the director, with his great experience of this work at the National Physical Laboratory, Sir Napier Shaw will be Professor of Meteorology; Mr. Leonard Bairstow, Professor of Aerodynamics; Mr. A. J. Sutton Pippard will deal with the structure and strength of aircraft, and Mr. A. T. Evans with aircraft engines.

Courses of lectures will also be given dealing respectively with airships and with navigation, while arrangements are in hand for special instruction in air-cooled engines, high-compression engines, dopes, instruments, wireless telegraphy, and similar subjects.

It has been arranged that part of the practical training of the students will be carried out at one of the Government establishments dealing with aeronautics.

THE INSTITUTE OF AERONAUTICAL ENGINEERS.

AUGUST NOTICES.

COUNCIL.—The Council met on August 17th.

ELECTIONS.—Member: Lt.-Commdr. V. N. Bieg, U.S.N.. Associate Member: R. B. C. Noorduyn. Associates: J. L. W. McDowall; N. W. Jackson; E. S. R. Thorne (all nominated for Intermediate Examination); J. C. C. Taylor (nominated for Pilots' Examination). Student: Chaucer Wood.

BRANCHES.—The rules for the issue of charters for the formation of foreign, colonial, and provincial branches of the Institute, proposed by the Branches Committee, have been ratified by the Council.

LECTURES.—Arrangements are being made for the following lectures to be delivered during the months October and November, respectively. The Structure of Steels, by Col. N. T. Belaiew, C.B., and the Education Act of 1918, by S. T. G. Andrews, Esq., B.Sc. (Eng.), M.I.Ae.E.

LIBRARY.—The following files have recently been added to the reference library:—

MANUFACTURERS' SPECIFICATIONS, 1920, Complete Aeroplanes; Hydro-Aeroplanes; and Flying Boats.

MANUFACTURERS' SPECIFICATIONS, 1920, Engines; Magnetos, Sparking Plugs; Carburetters; Radiators; Practical Flying, Application, etc.; Aeroplane Models; Miscellaneous Literature.

MANUFACTURERS' SPECIFICATIONS, 1920, Materials; Components.

PAPERS.—During the winter session meetings will be arranged for the delivery of short papers, as distinct from lectures. Members who have subjects for discussion at such meetings are invited to send brief outlines of the points they have to bring forward.

SEPTEMBER JOURNAL.—This will contain various features including, notes on the recent Aero Exhibition and other happenings; some reminiscences of a personal friend of Pilcher; an article on the future provision of fuel for internal combustion engines, by Major Bannerman-Phillips; abstracts of lectures and discussions; further extracts from the note-book of Howard-Flanders; and other general features relating to employment, business, etc. In addition a complete list of members will be published with the September Journal.

DOUGLAS SHAW, Secretary.

60, Chancery Lane, London, W.C.2.

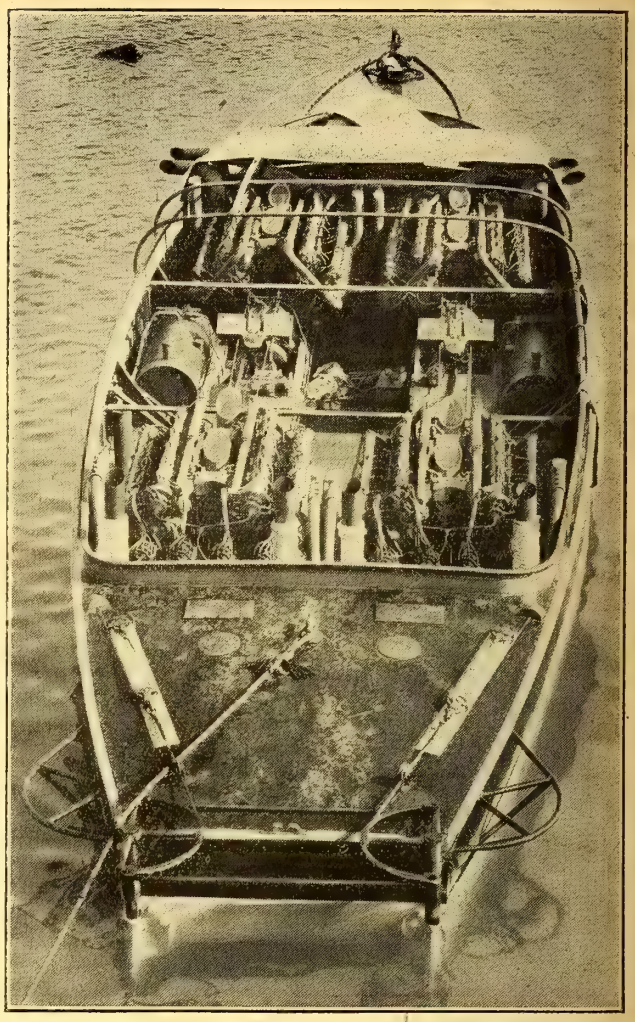
TO THOSE IN NEED.

The Council of the Institute of Aeronautical Engineers welcomes correspondence from firms and individuals who from time to time may require the services of Chief Mechanical Engineers, Designers, Mechanical Testers, Inspectors, Assistant Engineers, Managers, Works Managers, Draughtsmen (all grades), Accountants, Foreign and Colonial Representatives, Sales Managers, etc. Apart from being desirous of introducing suitably qualified applicants for such posts in the various branches of engineering, the Institute is disinterested in the matter. Communications should be addressed to Mr. Douglas Shaw, Secretary, The Institute of Aeronautical Engineers, 60, Chancery Lane, London, W.C.2.

APOLLO PLUGS.

It is of interest to note that Apollo sparking plugs were used in the B.R.2 engine in the Sopwith "Snipe" used by Capt. W. L. Jordan in the Aerial Derby. At the conclusion of the race they showed no wear or carbonisation whatever, though the engine was "all out" for the whole time. Capt. Jordan, who has had as much experience of the B.R.2 as anyone, says, "I think they are about the best plug I have ever used for this type of engine." His was the only one of the three "Snipes" to finish.

Mr. E. H. Seymour Tye has now joined the Sales Department of the Apollo Manufacturing Co., Ltd., who have their works in Moseley Street, Birmingham.—G. D.



The four 450-h.p. Sunbeam engines installed in the Racing Hydroplane Maple Leaf VI.

ARMSTRONG SIDDELEY NEW LONDON SERVICE DEPOT.

Armstrong Siddeley Motors, Ltd., of Coventry, and 10, Old Bond Street, W., announce the opening of a new London Service Depot at Church Street, Lisson Grove, N.W.8, for the convenience of owners requiring advice and inspection of their cars. The works are well equipped and there is a staff of trained mechanics. Special facilities are provided for adjustments and overhauls to chassis, electrical equipment, and coachwork. Exceptionally fine garage accommodation is available and a supply of spare parts is maintained.

BANKRUPTCY.

LIONEL MAURICE BONAS, 9, Marlborough Road, St. John's Wood, N.W.—A sitting for the public examination of this debtor, who is general manager of a company formed to manufacture aeroplane engine parts, was held on Aug. 3rd at the London Bankruptcy Court. A statement of his affairs showed liabililties £27,488 and a deficiency in assets of £23,331.

The debtor said that in May, 1917, he and another person registered a private company called the Richmond Engineering Co. with the object of manufacturing aeroplane engine parts. He was appointed a director and general manager of the company, but he recently resigned his directorship and was now general manager at a salary of £780 a year. The company was carrying on business successfully. The debtor attributed his failure to losses in betting and gambling, estimated at £12,000 in the past three years, and to extravagance.

The examination was concluded.

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OFFICIAL NOTICES.

NOTICE TO AIRMEN, No. 87.

AIR MINISTRY, August 18th, 1920.

It is hereby notified :—

Pilots are warned that a fixed balloon will be flown until October 31st from the grounds of the Crystal Palace, 5 miles N.N.E. from Croydon Aerodrome.

[It is understood, from other than official sources, that the said balloon will not ascend.—Ed.]

NOTICE TO AIRMEN (No. 88).

AIR MINISTRY, Aug. 19th, 1920.

It is hereby notified :

1. Since August 2nd, 1920, the hourly reports of meteorological information, prepared by the Forecast Service of the Meteorological Office and issued by W/T from the Air Ministry (Croydon), are being sent in a modified code, of which particulars are given below. The essential features of the code are the same as those for Collective Station Reports of Class 3 of Annex G of the Convention for International Air Navigation (Paris, 1919), but the following modifications are noted :—

(i) The figures for fitness for flying (FIF2) are replaced by figures reporting direction and approximate speed of the low cloud.

(ii) The separate codes for high or medium and low cloud have been replaced by a single code in which clouds are grouped, but no change is made in the number of figures allocated to cloud reports.

(iii) An additional group has been added to provide for the inclusion of information available only occasionally or at sea coast stations. This group includes more precise specification of the height of the base of the low cloud when it is below 1,000 feet. It includes also the character of the swell and sea disturbance and the visibility towards the sea as distinguished from the visibility landwards.

(iv) The direction of the surface wind is reported on the scale 0-32, and not as hitherto on the scale 0-72.

2. Reports are issued daily, Sundays included, according to the following schedule :—

Wave length—900 metres.
Nature of transmission—Continuous wave.
Call Sign—G.E.D.

Times of issue		0735	G.M.T.,	giving	observations	for 0700	G.M.T.
"	"	0835	"	"	"	0800	"
"	"	0935	"	"	"	0900	"
"	"	1035	"	"	"	1000	"
"	"	1135	"	"	"	1100	"
"	"	1235	"	"	"	1200	"
"	"	1335	"	"	"	1300	"
"	"	1435	"	"	"	1400	"
"	"	1535	"	"	"	1500	"
"	"	1635	"	"	"	1600	"

3. After the call sign G.E.D. comes the word "METEOR," indicating that a meteorological message is being transmitted. This is followed by one four-figure group giving the hour (G.M.T.) at which the observations were made; this time group is in turn followed by station index letters and figure groups giving the conditions at the following stations :—

Index Letters.	Station.
FXT	Felixstowe
CDN	Croydon
BGL	Biggin Hill
LMP	Lympne
BCD	Beachy Head
DNS	Dungeness
BOTLEY	Botley Hill (North Downs)

4. The letters DNS, when included, will be followed by a figure giving the Channel visibility at Dungeness. The Channel visibility at *Hythe* is given as the last figure of the fourth group of the report for LMP (Lympne), and the Channel visibility at Beachy Head is given as the last figure of the fourth group of the report for BCD (Beachy Head).

5. The word "BOTLEY" is followed by a statement in plain language of the conditions on the North Downs as viewed from Biggin Hill, when such a statement adds material information to that contained in the rest of the message.

6. At the end of the message a short forecast is given in plain language of the changes in the weather conditions anticipated in the period of daylight following the time of issue.

This begins with the word "FORECAST."

If there is no reason to modify the forecast sent in the preceding message the words "Forecast unaltered" are sent.

7. The complete results of a pilot balloon ascent at Croydon or Lympne, when available, are inserted in the message at 0835 immediately before the forecast referred to in paragraph 6.

This part of the message is preceded by the index letters of the station and by the five-figure index group 49860.

8. Copies of the detailed codes are to be found in Convention relating to International Air Navigation, Paris, 1919 (Command Paper 266), which can be obtained from H.M. Stationery Office.

Copies of the additional codes mentioned in paragraph 1 (i), (ii), and (iii), can be obtained on application to the Director, Meteorological Office, Air Ministry, Kingsway, W.C.2.

9. French reports similar to the above are issued from Le Bourget (call sign ZM, wave-length 900 m., continuous wave) at the following times (G.M.T.) :—

0730	(giving	observations	for	0700)
0930	(	"	"	0900)
1030	(	"	"	1000)
1230	(	"	"	1200)
1330	(	"	"	1300)
1530	(	"	"	1500)
1830	(	"	"	1800)

These reports include observations from the following stations :—

Le Bourget	(Index Group P.1)
St. Inglevert	(Index Group P.2)
Abbeville	(Index Group P.3)
Maubeuge	(Index Group P.4)
Havre	(Index Group P.5)

The code used is identical with that in which the collective reports for S.E. England are sent, except that in the codes for present and past weather (ww and WW in the third group) only a selection of the numbers in S.E. England code is employed.

In addition, a special message is sent at 09.45 (G.M.T.), giving the upper wind at Le Bourget at 08.00 in the code :—

Sernac HHHH Pr Pilot DDVV DDVV DDVV DDVV DDVV

where HHHH—Time of message

DD—Direction of wind on the scale 1 to 72 points.

VV—Speed of wind in metres per second,

the five groups DDVV referring to the wind at heights of 500 metres (1,500 feet), 1,000 metres (3,000 feet), 1,500 metres (5,000 feet), 2,000 metres (7,000 feet), and 3,000 metres (10,000 feet)

Authority for Clause 9—French "Notice to Airmen" No. 10.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

Date 1920.	Name of Air Line.	Type.	Markings.	Where from	Where to	Time depart.	Time arrive	Cargo lbs. M=Mail	No. of Passengers.	Pilot.
August 16th	A.T. & T.	DH16	G-EAPT	London	Paris	09 47	—	Gds&M.	1	Reeve
	A.T. & T.	DH9	G-EAOZ	London	Amsterdam	10 10	13.02	Goods	Nil	Tebbitt
	M.A.	Breguet	F-CMAF	London	Paris	13.07	15.45	Nil	Nil	Le Men
	I.A.L.	"Vimy"	G-EASI	London	Paris	13.33	16.50	Nil	1	Barnard
	C. des G.E.A.	"Goliath"	F-HMFU	London	Paris	12.48	—	Nil	Nil	Patin
	A.T. & T.	DH16	G-EALM	Paris	London	09.30	11.45	Nil	4	Robbins
	A.T. & T.	DH9	G-EAQN	Paris	London	09.58	13.10	Nil	1	Bamber
	C. des G.E.A.	"Goliath"	F-GEAD	Paris	London	10.50	14.00	Goods	1	Favrant
	A.T. & T.	DH16	G-EAPT	Paris	London	15.40	18.05	Goods	Nil	Reeve
	I.A.L.	"Vimy"	G-EASI	Paris	London	17.35	11.55 17th	Goods	13	Barnard
	A.T. & T.	DH9	G-EASW	Amsterdam	London	16.04	18.55	Gds&M.	2	Bradley
August 17th	A.T. & T.	DH16	G-EAPT	London	Paris	09 30	11.40	Gds&M.	2	Game
	A.T. & T.	DH16	G-EALM	London	Paris	09.35	12.05	Nil	3	Lines
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10.15	13.45	Goods	Nil	Carter
	A.T. & T.	DH16	G-EASW	London	Paris	16.55	19.15	Nil	3	Robbins
	A.T. & T.	DH9	G-EAGY	London	Paris	16.40	19.10	Nil	2	Milnes

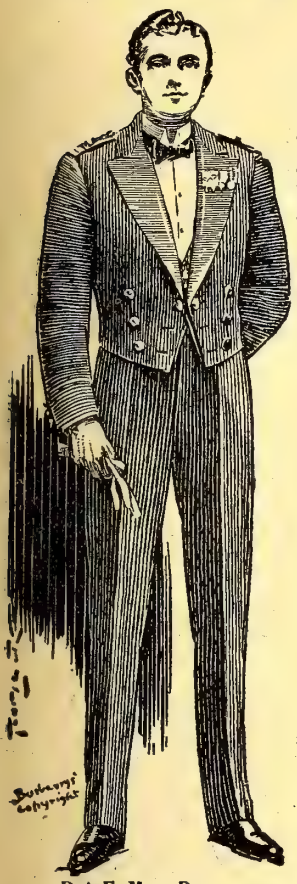
Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M = Mail.	No of Passengers.	Pilot.
August 17th	A.T. & T.	DH16	G-EALU	London	Paris	17.20	19.55	Nil	3	Forson
	A.T. & T.	DH16	G-EALM	Paris	London	17.05	19.15	Goods	2	Game
	A.T. & T.	DH9	G-EAOZ	Amsterdam	London	15.15	18.00	Mail	2	Tebbitt
August 18th	A.T. & T.	DH9	G-EAQN	London	Paris	09.35	12.00	Gds&M.	1	Tebbitt
	A.T. & T.	DH16	G-EALM	London	Paris	09.35	11.50	Nil	3	Bradley
	C. des G.E.A.	"Goliath"	F-GEAD	London	Paris	10.50	14.05	Goods	Nil	Favrant
	A.T. & T.	DH9	G-EAPU	London	Amsterdam	11.35	14.55	Goods	Nil	Bamber
	A.T. & T.	DH16	G-EAPT	Paris	London	09.55	12.30	Nil	2	Lines
	C. des G.E.A.	"Goliath"	F-GEAC	Paris	London	11.00	14.20	Goods	Nil	Labouchère
	A.T. & T.	DH16	G-EALU	Paris	London	11.10	13.31	Nil	Nil	Robbins
	C.T.	Nieuport	F-CGTA	Paris	London	12.25	15.20	Mail	Nil	Petit
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	15.14	18.20	Mail	Nil	Carter
	A.T. & T.	DH16	G-EASW	Paris	London	17.10	13.50 19th	Nil	3	Forson
	A.T. & T.	DH9	G-EAGY	Paris	London	17.25	11.00 19th	Nil	1	Milnes
August 19th	A.T. & T.	DH16	G-EAPT	London	Paris	09.35	11.40	Nil	4	Game
	A.T. & T.	DH9	G-EAPL	London	Amsterdam	10.05	—	Goods	Nil	Lines
	C.T.	Nieuport	F-CGTA	London	Paris	10.25	15.20	Nil	Nil	Petit
	I.A.L.	"Vimy"	G-EASI	London	Paris	13.20	15.40	Goods	7	Chattaway
	C. des G.E.A.	"Goliath"	F-GEAC	London	Paris	15.23	17.52	Goods	3	Labouchère
	A.T. & T.	DH16	G-EALU	London	Paris	16.52	18.55	Gds&M.	2	Reeve
	A.T. & T.	DH16	G-EALM	Paris	London	14.00	16.40	Goods	3	Tebbitt
	A.T. & T.	DH16	G-EAPT	Paris	London	16.30	19.00	Nil	4	Bradley
August 20th	A.T. & T.	DH16	G-EALM	London	Paris	09.35	11.35	Gds&M.	3	Robbins
	A.T. & T.	DH16	G-EAPT	London	Amsterdam	11.00	13.41	Goods	Nil	Forson
	A.T. & T.	DH9	G-EAQN	London	St. Inglevert	11.32	—	Nil	2	Carter
	A.T. & T.	DH9	G-EAOZ	London	St. Inglevert	17.10	—	Nil	2	Milnes
	A.T. & T.	DH16	G-EALM	London	Paris	17.50	19.50	Gds&M.	3	Tebbitt
	C. des G.E.A.	"Goliath"	F-GEAD	Paris	London	12.45	16.45	Goods	6	Labouchère
	C.T.	Nieuport	F-CGTI	Paris	London	12.25	16.08	Mail	Nil	Le Comte
	A.T. & T.	DH16	G-EALM	Paris	London	14.40	17.10	Nil	4	Game
	I.A.L.	"Vimy"	G-EASI	Paris	London	15.10	18.20	Goods	3	Chattaway
	A.T. & T.	DH9	G-EAGY	Paris	London	16.45	19.22	Nil	2	Robbins
	A.T. & T.	DH9	G-EAQN	St. Inglevert	London	—	17.06	Nil	Nil	Carter
	A.T. & T.	DH9	G-EAPU	Amsterdam	London	15.23	19.20	Gds&M.	Nil	Bamber
August 21st	A.T. & T.	DH9	G-EAGY	London	Deauville	09.18	—	Nil	1	Carter
	C.T.	Nieuport	F-CGTI	London	Paris	09.53	12.05	Nil	Nil	Le Comte
	A.T. & T.	DH9	G-EAQN	London	Amsterdam	10.35	15.15	Goods	Nil	Bamber
	A.T. & T.	DH16	G-EASW	London	Paris	11.15	13.25	Gds&M.	2	Bradley
	C. des G.E.A.	"Goliath"	F-GEAD	London	Paris	11.48	14.30	Goods	Nil	Labouchère
	A.T. & T.	DH18	G-EAUF	London	Paris	16.30	18.45	Gds&M.	6	Powell
	A.T. & T.	DH9	G-EAPU	London	Paris	16.40	18.45	Nil	2	Game
	A.T. & T.	DH16	G-EALM	Paris	London	10.05	12.34	Goods	2	Tebbitt
	A.T. & T.	DH16	G-EASW	Paris	London	16.30	19.00	Goods	4	Bradley
	H.P.T.	Hand'y Page	G-EATM	Paris	London	17.40	12.50 22nd	Nil	7	McIntosh
	A.T. & T.	DH9	G-EAOZ	St. Inglevert	London	—	19.30	Nil	Nil	Milnes
August 22nd	A.T. & T.	DH16	G-EALM	London	Paris	10.15	12.15	Goods	2	Tebbitt
	A.T. & T.	DH9	G-EAPL	Amsterdam	London	08.58	13.35	Nil	1	Lines
	A.T. & T.	DH9	G-EAPU	Paris	London	10.15	12.50	Goods	1	Game
	A.T. & T.	DH16	G-EAPT	Amsterdam	London	13.15	17.15	Nil	3	Forson

The Air Port of Cricklewood.

(Compiled from Air Ministry Communiqués. Log of Cricklewood Aerodrome received too late for inclusion.)

August 16th	H.P.T.	Hand'y Page	G-EATM	London	Paris	12.07	15.20	Nil	3	
	H.P.T.	DH9	H-9246	London	Amsterdam & Copenhagen	11.39	Left Am'dam 16.58	Nil	Nil	
	H.P.T.	Hand'y Page	G-EATN	Paris	London	12.20	15.48	Goods	10	
	H.P.T.	DH9	G-EAUQ	Amsterdam	London	—	14.24	Nil	Nil	
	H.P.T.	DH9	G-EATA	London	Brussels	15.02	17.35	Nil	2	
	H.P.T.	Martinsyde	G-EATD	London	Brussels	15.27	—	Nil	Nil	
	H.P.T.	DH9	G-EAUC	Brussels	London	15.00	17.40	Nil	Nil	
	H.P.T.	DH9	G-EAUQ	London	Amsterdam	16.24	17.15	Nil	Nil	
	H.P.T.	Bristol	G-EASH	London	Brussels	—	—	Nil	Nil	
	H.P.T.	Avro	G-EAVD	London	Brussels	—	—	Nil	Nil	
August 17th	H.P.T.	DH9	G-EAUQ	Amsterdam	London	11.34	—	Gds&M.	2	
	H.P.T.	Hand'y Page	G-EATG	London	Paris	12.18	15.35	Goods	4	
	H.P.T.	Hand'y Page	G-EATM	Paris	London	12.30	15.58	Mail	7	
	H.P.T.	DH9	G-EAUH	London	Brussels	14.40	—	Mail	Nil	
	H.P.T.	DH9	G-EAUC	London	Amsterdam	16.14	—	Nil	Nil	
	H.P.T.	DH9	G-EATA	Brussels	London	—	17.55	Nil	Nil	
August 18th	H.P.T.	DH4	O-16	London	Brussels	10.45	12.40	Nil	Nil	
	H.P.T.	Hand'y Page	G-EATN	London	Paris	12.00	15.20	Nil	9	
	H.P.T.	Hand'y Page	G-EASL	London	Paris	12.00	15.20	Goods	4	
	H.P.T.	Hand'y Page	G-EATG	Paris	London	12.30	16.00	Nil	9	
	H.P.T.	Hand'y Page	G-EASN	Paris	London	12.30	16.00	Nil	4	
	H.P.T.	DH4	O-9	London	Brussels	12.57	14.40	Nil	Nil	
	H.P.T.	DH9	G-EAUC	Amsterdam	London	—	14.50	Nil	Nil	
	H.P.T.	DH9	G-EAUQ	London	Brussels	14.40	16.45	Gds&M.	Nil	
	H.P.T.	DH9	G-EAUC	London	Amsterdam	17.00	—	Nil	Nil	
	H.P.T.	DH9	G-EAUH	Brussels	London	—	17.55	Nil	Nil	
August 19th	H.P.T.	Hand'y Page	G-EASY	London	Paris	12.07	15.15	Goods	10	
	H.P.T.	DH4	O-18	London	Brussels	12.07	—	Nil	Nil	
	H.P.T.	DH9	G-EAUI	London	Brussels	14.35	—	Mail	Nil	
	H.P.T.	Hand'y Page	G-EATN	Paris	London	13.20	17.25	Gds&M.	6	
	H.P.T.	DH9	G-EAUH	London	Amsterdam	16.10	—	Nil	Nil	

The New R.A.F. Uniform



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Best Cast Steel Files.

"Hardenbright," the paste for protecting the teeth and cutting edges of high speed steel tools during hardening.

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SHEFFIELD.

Date 1920	Name of Air Line.	Type.	Markings.	Where from.	Where to.	Time depart.	Time arrive.	Cargo lbs. M=Mail.	No. of Passengers.	Pilot
August 20th	H.P.T.	Hand'y Page	G-EATM	London	Paris	12.10	15.00	Goods	8	
	H.P.T.	Hand'y Page	G-EASL	Paris	London	12.45	16.50	Nil	9	
	H.P.T.	DH9	G-EATA	London	Brussels	14.40	16 30	Gds&M.	Nil	
	H.P.T.	DH9	G-EAUI	Brussels	London	15.20	—	Nil	Nil	
	H.P.T.	DH9	G-EAUC	Amsterdam	London	—	15.50	Nil	Nil	
	H.P.T.	DH9	G-EAUH	Amsterdam	London	—	16.00	Nil	Nil	
	H.P.T.	DH9	G-EAUN	London	Amsterdam	16 05	—	Nil	Nil	
	H.P.T.	Hand'y Page	G-EASY	Paris	London	17.00	20.50	Goods	4	
August 21st	H.P.T.	Hand'y Page	G-EALX	London	Paris	12.05	14.50	Goods	10	
	H.P.T.	DH4	O-10	London	Brussels	14.30	—	Nil	1	
	H.P.T.	Avro	G-EAHX	London	Brussels	14.40	Landed Lympne	Nil	Nil	
	H.P.T.	DH9	G-EAUC	London	Brussels	15.00	17.55	Gds&M.	Nil	
	H.P.T.	Hand'y Page	G-EALX	Paris	London	17.00	21.00	Goods	3	
	H.P.T.	DH9	G-EAUN	Amsterdam	London	—	15.45	Nil	Nil	
	H.P.T.	DH9	G-EAUI	London	Amsterdam	16.45	—	Nil	Nil	
	H.P.T.	DH9	G-EATA	Brussels	London	10.05	18.00	Nil	2	
August 22nd	H.P.T.	DH4	5929	Brussels	London	10.25	—	Nil	1	
	H.P.T.	Hand'y Page	G-EASL	London	Paris	12 45	15.35	Nil	5	
	H.P.T.	Hand'y Page	G-EASZ	London	Paris	—	15.35	Nil	Nil	

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aériennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aériens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.
Where times are missing it is probably owing to Atmospherics affecting signals.

Inland Flying at Croydon.

Aug. 16th.—Nil.

Aug. 17th.—A.T.T., D.H.9, 1 joy-ride; 2 D.H.9's, tests; D.H.16, test.

Aug. 18th.—A.T.T., D.H.16, 1 joy-ride; D.H.16, test.

Aug. 19th.—A.T.T., Avro, Penshurst, return.

Aug. 20th.—A.T.T., D.H.9, Hendon, return; D.H.9, test; D.H.18, test; I.A.L., Vimy, test; R.A.F. Bristol Fighter F.4385, Kenley, return.

Aug. 21st.—A.T.T., Avro, 3 joy-rides; I.A.L., Vimy, test.

Aug. 22nd.—I.A.L., Vimy, 3 joy-rides, D.H.4, 2 joy-rides, 1 test. The I.A.L. carried 32 joy-riders on the 5 flights. H.P.T., Ltd., H.P. to Cricklewood.

Inland Flying at Cricklewood.

Aug. 16th.—Martinsyde test, D.H.9. test.

Aug. 17th.—Sopwith "Snipe" from Brooklands.

Aug. 18th.—D.H.4 test.

Aug. 19th.—Two D.H.4 tests, Avro from Hendon; Avro from Melton Mowbray; Avro to Brooklands.

Aug. 20th.—Avro from Hendon and local test.

Aug. 21st.—Two D.H.9s local test; D.H.9 from Lympne.

The London Terminal Aerodrome.

Mlle. Boland has not yet arrived. One cannot help thinking that either she had not intended to fly to England, or else she exercised a woman's privilege and changed her mind at the last moment.

One of the more competitive members of the fair sex desires to be the first to knit a complete jumper during a flight from London to Paris. One would suggest that the "Goliath" would be an excellent machine in which to make the attempt, because there is ample elbow room in this, and also it allows an ample proportion of time. The lady in question has already expressed herself delighted with the colour and fittings of the "Goliath."

A Handley Page coming from Paris on Saturday was overtaken by darkness and was forced to land at Eltham, apparently owing to indistinct lights at Croydon, which, of course, is not yet open for night flying. An excellent landing was made in the dark, which is not surprising, as one believes that the pilot was Mr. MacIntosh, who has so often successfully performed juggling feats with Handley Pages under difficulties in the past.—G. D.

The Instone Air Line.

The "Vimy" came back from Paris with 15 passengers and a large amount of freight last week. During the voyage over on Thursday, Mr. Hudson, who has recently been presented with a cigarette case by the Marconi Wireless Telegraph Co. for being the first mechanic to operate a wireless telephone from commercial aircraft, spoke by wireless and "wireful" telephone to one of the directors of the Air Line, Mr. Samuel Instone. Mr. Instone gave him verbal instructions to "tell Paris to wire state of coal at Marseilles."

The atmospherics (or what the late Mr. Basil Hallam, when a flight commander in No. 1 Kite Balloon Section, used to call "electrics" to the annoyance of his squadron commander) were particularly bad on that day, so hearing was not good and the ground telephone line was very weak.

The D.H.4, name the "City of Cardiff," is now overhauled, and went to Paris *via* Brussels on Monday, and the Vimy did her usual Paris trip.

On Sunday passengers were fighting for seats in the Vimy for joy-rides. Some of the passengers who were in the D.H.18 crash last week, crossed later on the Vimy, one of them remarking that he did not think "this little old ark would come to any harm."—G. D.

The Air Port of Cricklewood.

One learns that the Cie. Messageries Aeriennes, whose machines have hitherto used Croydon for their terminus, have now transferred to Cricklewood. The reason for the move is that they work in conjunction with Handley Page, Ltd. The fact that Cricklewood is the wrong side of London will not really add very much to the total time of travelling, as it takes some ten minutes or so less to reach London from Cricklewood than from Croydon.

An aeroplane will leave Cricklewood on Aug. 26 for Lucerne. This is by arrangement with the Ad Astra Company. Passengers will be afforded an aerial view of the Swiss passes and Alps. The single fare is £21 and return is £37 10s. The return flight will take place in about a week.—G. D.

Bedford.

On Monday, Aug. 16th, Mr. James Gordon Riley was killed in an aeroplane accident near Bedford. No details are to hand. The machine seems to have been left in the open for some considerable time.

Mr. Riley, one believes, belonged to the By-Air Company, a joy-riding concern who were summoned some time ago for not being properly registered in accordance with Air Ministry instructions.

It should be pointed out that this is not the Mr. Riley, of the late lamented Airco, who took the series of photographs of London which appeared some time back in THE AEROPLANE.—G. D.

Brooklands.

The words "Vickers, Ltd., Brooklands," now appear in very large white block letters on the side of one of the erecting shops of Messrs. Vickers' Brooklands works, facing the railway for all and sundry to read, mark, and learn. This is the most exciting occurrence that has happened at the aerodrome for some weeks, but Martinsydes, Sopwiths, and other people have continued their useful test flying.—J. F. S.

Cowes.

During the motor-boat races in Osborne Bay, I.O.W., "Miss America," the winning boat, was in need of a set of plugs of a special type. Time was short and ordinary methods of dispatch would have been of no use. Accordingly, on receipt of a wire, Major Chalmers, the firm's business representative in London, probably not an English business man owing to his astuteness in recognising the value of aircraft, obtained the plugs, motored to an aerodrome and went by air to Hythe, Southampton, where he was met by a motor-boat and "Miss America" was duly re-plugged.

Farnborough.

The Royal Aircraft Establishment Athletic Club held their fourth annual sports meeting on the Factory (or Establishment?) Sports Ground on Saturday, Aug. 14th, and the meeting was a most successful one, everything and everybody going "all out" (not out of the ground). Although, unfortunately, no aeroplanes competed in the races, the events were sufficiently interesting, P. N. Baker, of Herne Hill Harriers, doing very well in winning the 100 and 220 yards open handicaps in 10 1-10 sec. and 23 3-5 sec. respectively. Serjt.-Major Mawby, R.A.F., and Surrey A.C., was second in the 100 yards handicap, having one yard start, while Baker received seven yards. The R.A.E. departmental medley relay race for a

cup presented by Air Commodore Brooke-Popham was won by "E" Dept., "K 4" being second. "R" Dept. beat "T 1" in the final of the tug-of-war and so won the Foremen's Cup for the fourth year in succession. "G" Dept., with a total of 23 points, won Capt. Nevill's Cup for the department gaining the highest number of points at the meeting.

Mrs. Sydney Smith, wife of the superintendent, presented the prizes, and was accorded a hearty vote of thanks, to which Mr. Sydney Smith, O.B.E., replied on her behalf, saying that he felt sure such gatherings were of great value to individuals and to the community.

A dance was held in the evening in the main canteen of the R.A.E.—J. F. S.

Weybridge.

The annual sports of the Lang Propeller Social Club were held at Addlestone on Saturday, Aug. 14th, when some excellent racing for prizes provided from the funds of the Club was witnessed, and an enjoyable time was spent by a good crowd. The prizes were distributed by Mrs. C. A. Laing, wife of the works manager, Mr. C. A. Laing. The judges consisted of the above-mentioned lady and gentleman and Messrs. B. R. Laing and H. Bennett.

The Cabinet Shop (this indicates part of the post-war activities of the firm) won the tug-of-war and the relay race, the Engineers being second in the latter event.—J. F. S.

Woking.

Mr. R. H. Nisbet, who has been a test pilot and assistant designer for Martinsyde, Ltd., for a considerable period, has journeyed to Canada on business for the firm, particularly in connection with the provision of commerial aercoplanes for various useful purposes in that country.—J. F. S.

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

Across Australia.

Lieutenants Farer and McIntosh, whose arrival in Australia on August 2nd was recently announced, arrived at Sydney on August 22nd after a forced landing at Newcastle owing to shortage of petrol. They are flying to Melbourne from Port Darwin.

The Royal Mail.

As announced last week, the letters for the suite of H.R.H. the Prince of Wales were conveyed on August 19th from Port Augusta to Campbelltown, 50 miles from Sydney. The machine carrying the mail was damaged and was forced to alight at Cootamundra, the mail being carried the remainder of the journey by the relief machine. The mail was taken by motor-car from Campbelltown to Sydney, and delivered aboard the *Renown* the same night.

NEW ZEALAND.

An Air Board in New Zealand.

The New Zealand correspondent of THE AEROPLANE writes from Wellington, N.Z., on June 24th :—

The appointment has just been announced by the Cabinet of an Air Board for New Zealand. The Board consists of the following members :—

President, Major-General Sir E. W. Chaytor, K.C.M.G., K.C.V.O., C.B., A.D.C.

Members : Brigadier-General G. S. Richardson, C.B., C.M.G., C.B.E.; Commander G. A. Williams, C.B.E., R.N.; and representatives of the following Departments : Land and Survey—Mr. T. N. Brodrick; Public Works—Mr. R. W. Holmes, I.S.O., Mr. F. Furkert; Post Office—Mr. A. T. Markman and Mr. G. M'Namara.

Secretary, Lieutenant-Colonel J. L. Sleeman, C.B.E., M.V.O., I.G.S.

The duties of the Board will be as follows :—

(1) To consider all questions of aviation in the Dominion, and to advise the Minister responsible.
(2) To consider and report upon all aviation proposals submitted to the Government.
(3) The consideration of all air service questions, commercial, military and naval, in connection with New Zealand.
(4) The maintenance of touch with the Air Ministry in England.
(5) The study of aviation activities throughout the world in order to keep pace with modern developments.

Power is given the Board to call in experts on aviation to give evidence when necessary, and to obtain expert advice from the Air Ministry in England.

A glance at the constitution and duties of the Board reveals the fact that the Board will chiefly be concerned with the development of commercial aviation, military and naval aviation being only a secondary consideration. Five of the nine members of the Board are members of civil departments of the State, and their departments are the ones most principally interested in the development of aviation in the Dominion. The representatives from the Lands and Survey and Public Works Departments will be largely concerned with the selection and setting aside of suitable sites for future aerodromes and aviation grounds throughout the Dominion, while the Postal Department will chiefly be concerned with the development of aerial mail services. Of course, the military and naval aspect will receive consideration, but it is unlikely that any large scheme will be embarked upon. The reason for this is, of course, the lack of funds. With the heavy financial burdens facing the country it is not thought wise by the Government to go in for any big and naturally costly aerial undertakings.

A great deal of comment has been made on the fact that no aviator is included in the constitution of the Board. The president, Major-General Chaytor, and Brigadier-General Richardson both saw service during the Great War, but neither of them are experts, or anything like experts, in aviation. Brigadier-General Richardson is the General Officer-in-Charge of the Administration of the N.Z. Military Forces, while Colonel Sleeman, the secretary of the Board, is the Director of Military Training. Commander Williams is the Naval Adviser to the New Zealand Government. On the civilian side of the Board, Mr. A. T. Markman is the First Assistant Secretary to the Post Office, and Mr. M'Namara the Second Assistant Secretary; Mr. Holmes is the Chief Engineer in the Public Works Department, and Mr. F. Furkert the Deputy Chief Engineer.

Referring to the absence of an aviator on the Board, the Government states that it is considered that aviation in New Zealand must be developed mainly, if not wholly, along civilian lines, and the Board must therefore frame its policy in accordance with the civilian and not the expert aspect. When expert advice is needed experts will be called in or the Air Ministry in England approached. In fact, the Board is for "aviation planning" purposes, and in this respect is not to spend more money than is absolutely necessary.—H. B.

FOREIGN INTELLIGENCE.

SWITZERLAND.

The Swiss Federal Authorities and Air Lines.

The first Franco-Swiss Air Line, that between Paris and Geneva, has ceased to exist. During the last week of July the service was temporarily suspended while Durafour, one of the earliest Swiss pilots, who was the founder of the line, made his last negotiations with the Federal "Office Aérien." But the last rules of this Office, rules bearing in particular on the security of passengers, do not accord with the corresponding French rules. One does not ignore the fact that the Société Aéro-Transport, which is running this line, receives from the French Government a subsidy permitting it to exist, although at the actual moment its expenses exceed its receipts. If this subsidy is suppressed the Société must cease to exist, and if the Directorate of the Société obeys the Swiss regulations it comes into conflict with the French regulations and cannot receive the subsidy.

Consequently Durafour has written to the Federal Office Aérien a letter which contains in principle the following points :—"One might believe that the Federal Office Aérien had been created to aid aerial traffic and those who practise aviation. Instead of doing so it issues regulations such that it is impossible for us to fulfil them and to continue running the Paris-Geneva line."

"I am," says he, "the oldest Swiss pilot. My school was founded at my own expense, and when war broke out I was one of the few Swiss pilots existent. I have given myself entirely to my country. I have created, with my French friend Minier, the first and only Air Line from Switzerland abroad, and we had a project to establish a Lyons-Geneva Air Line. After all this I had a right to hope for a little recognition from my country. But no! For on a question of detail I am forbidden to continue my work."

The Federal Office Aérien has also given explanations on its own side. Meantime one believes that one might have a little more reasonableness in the rules of the Office Aérien so as not to frighten away those who have aviation at heart. Undoubtedly the regulation of aviation is necessary, but one should not hinder those who wish to make aviation progress from following their work, above all when, as in the case of M. Durafour, that work is useful for the specific aggrandisement of the country and of aviation. It is not hindrances but encouragements which ought to be handed out and officialdom ought to work to reconcile the detail regulations of France and Switzerland so that forthcoming pioneers of Franco-Swiss Air Lines shall not meet too many obstacles. —X.

NAVAL AND MILITARY AERONAUTICS.

NAVAL

ADMIRALTY APPOINTMENT

The following appointment has been made:—

Aug. 17th.—Lieut.—E. Joisce, to *Vindictive*, Aug. 16th.

MILITARY

The Mesopotamian Fighting.

A War Office statement issued on August 23rd deals with the situation in Mesopotamia. The following is extracted therefrom:—

> The Feluja-Ramadie area (west of Baghdad) is unsettled and looting and raiding is taking place. Aeroplanes observed transport aground and burnt in the river.

Hounslow Aerodrome.

It is understood that the War Office will use the sheds at Hounslow Aerodrome as the R.A.S.C. central repairing depot for the United Kingdom. Major Organ, D.S.O., will be in charge.

AIR FORCE.

OFFICIAL COMMUNIQUES.

PURCHASE OF DISCHARGE FROM THE ROYAL AIR FORCE.

The Air Ministry announced on Aug 19th.

The following rates have been established as those which shall be paid by airmen who are permitted to purchase their discharge from the Royal Air Force:

(i) Recruits (airmen or boys) with less than three months' service—£20.

(ii) Boys and airmen entered as boys, who have been or are being trained in the Royal Air Force for a trade in Group I or for a trade in Group II the equivalent of which in civil life would have involved the serving of an apprenticeship—£100.

(iii) Boys, and airmen entered as boys, who have been trained or are being trained in the Royal Air Force in a trade in Group II the equivalent of which in civil life would not have involved an apprenticeship—£60.

(iv) Airmen entered as semi-skilled men whose training was continued in the Air Force in any of the trades in either Group I or II—£60.

(v) Airmen (including boys) entered and trained in the Navy, Army or Air Force and subsequently placed in Group A, B, C or D of the R.A.F. Medical Service—£60.

(vi) All other airmen, and airmen serving in Class "E" of the Royal Air Force Reserve—£35.

The trades in Group II which in civil life would involve an apprenticeship are shown below:

Balloon Basket Maker, Electrician, Machinist, Carpenter, Coach-painter, Sheet-Metal Worker, Tinsmith.

The above amounts may be reduced in certain circumstances by authority of the Air Council, provided that such reduction does not exceed 50 per cent. of the total sum payable.

APPLICATIONS BY RELATIVES.—Applications by parents or guardians in respect of boys should be made by letter, giving the fullest possible particulars of the circumstances in which the application is made, addressed to: The Secretary, Air Ministry, Kingsway, London, W.C.2.

Applications submitted by boys on their own behalf will not be considered.

Applications by relatives of serving airmen should be made by letter, giving the fullest information of the circumstances in which the application is made, addressed to the officer commanding the unit in which the airman is serving.

APPLICATIONS BY RESERVISTS.—Applications from airmen who are serving in the Reserve should be submitted to the Officer i/c Records, Royal Air Force, Blandford, Dorset.

"WAKEFIELD" SCHOLARSHIPS FOR R.A.F. CADETS.

The Air Ministry announced on Aug. 19th:—

Sir Charles Wakefield has generously undertaken to provide funds during the next three years for the award of two scholarships annually, each of a value of £75 per annum, which will be tenable at the R.A.F. Cadet College, Cranwell.

This offer, which has been made in order to assist cadets whose parents or guardians are in reduced circumstances, have been gratefully accepted by the Air Council. The Scholarships will be known as "Wakefield Scholarships."

One scholarship will be offered for competition each year at the examination for admission to the College held in June and one at that held in November. The first award will be made in connection with the examination held in November, 1920.

The scholarship on each occasion will be awarded to the candidate from amongst those considered eligible by the Air Council who passes highest in the examination. In determining who is eligible the Air Council will give preference to those candidates whose reduced circumstances are due to the late War. A King's Cadet, a Prize Cadet or a candidate nominated by the Air Council under the Regulations will not be considered eligible to hold a "Wakefield" Scholarship.

The Scholarships, which will be tenable for two years, will be paid in advance in equal instalments at the beginning of each of the four terms of residence.

The names of intending candidates should be forwarded to the Secretary (S.7), Air Ministry, Kingsway, London, W.C.2, from whom any further information required may be obtained. Applications should be received not later than January and May in the case of candidates who propose sitting for the examinations held respectively in the following June and November. Applications should be accompanied by a full statement (which will be treated as strictly confidential) of the circumstances of the candidate's case.

In view of the imminence of the forthcoming examination in November, 1920, applications to compete for the Scholarship will be accepted on this occasion only, provided that they reach the Air Ministry not later than Oct. 1st, 1920.

Applications to compete for a Scholarship should be sent forward independently of the ordinary application for admission to the examination for the purpose of entry to the Royal Air Force Cadet College. These latter applications should continue to be addressed to the Secretary, Civil Service Commission, Burlington Gardens, London, W.1, and should be forwarded in the manner prescribed and not later than the dates given in the announcement issued by the Civil Service Commissioners in advance of each examination.

Courts-Martial Rules.

It was announced in the *London Gazette* of Aug 17th that the Air Ministry gives 40 days' notice of the Rules of Procedure (Air Force), 1920, which will govern the administration of Courts-Martial in the Air Force. Copies of the rules (price 3s.) can be obtained from any public body or by application to the Secretary, Air Ministry, Kingsway, W.C.2, within 40 days.

To Save Others.

The following brief story of the death of Mr. A. L. Courtney-Dunn, Flying Officer, R.A.F., as told by one who was on the spot, will give food for thought to those who thought that when our war with Germany ceased all our other wars ceased also and that the gallantry and self-sacrifice of the British soldier was no longer needed.

"During the advance of the Derajat Column to Kaniguran, the Force Commander ordered that the villages of the Shakai Wazirs should be bombed to prevent them raising a force to assist the Mahsuds. This was done and reported to be entirely successful. On the last raid Flying Officer Courtney-Dunn and his observer (Sergt. Palmer, D.F.M.) reported that a machine gun had been firing at them from one of the villages, and they were accordingly sent out next day to bomb this village again.

"On their way to Shakai the radiator of the aeroplane commenced to leak, and they turned to come back. The water very quickly ran out, however, and they found that they were obliged to land where they were. The observer asked Courtney-Dunn if he should pull off the bombs, but the pilot replied, 'No, don't pull them off; they will only kill some of these people who live here, and they are not hostile—and I can put her down quite all right.'

"The machine was therefore landed on the river bed with the bombs on. The river beds in Waziristan are of large pebbles smoothed by the water. At this time of the year there is not much water in the rivers, and most of the beds are nearly dry. A very good landing was made, but, unfortunately, a rock struck one of the bombs as the machine was taxiing, causing it to explode.

"Both pilot and observer were thrown some twenty yards by the explosion, and the pilot was covered with burning petrol. They were both apparently unconscious for a short time (possibly only a few seconds), and then Sergt. Palmer assisted Courtney-Dunn to extinguish the flames. The exertion of this caused them both to lose consciousness again, and when the observer came to they were both being carried away by the Mahsuds.

"As far as I could ascertain from a close interrogation of the Mahsuds who took away the pilot, and from what was seen by the Intelligence Agents whom I had sent out to arrange for his return, the tribesmen treated him very carefully and administered to his burns with such remedies as they use among themselves. They were told that they were to bring him in immediately, when they would receive the reward promised by the Government of India for bringing in aviators who land in their country, and that if they delayed in doing so they would be heavily punished by bombing. They accordingly brought him in, carrying him 13 miles over the hills on a native bedstead, and he was admitted to Jandola Hospital 20 hours after the crash. The Mahsuds said that the journey took a long time as they had to stop frequently to give him water.

"I saw him in hospital that afternoon and spoke to him. His condition was very critical—temperature 94 degrees owing to the shock of the burns and wounds in his right knee caused by splinters of bomb. The R.A.M.C. officer in charge of the hospital did all he could for him, but the end came very quietly at 1 a.m.

"We are all very deeply touched by the nobility of his action in refusing to allow the bombs to be dropped, thus willingly taking the risk of a forced landing with a full load of bombs rather than let them fall upon villages which never had been bombed."

IRELAND.

An Irish Raid.

It is reported from County Waterford that an aeroplane which landed at Garrybrittas, in the Dungarvan district, during the week-end, was set on fire by masked and armed men.

POLAND.

OFFICIAL COMMUNIQUE.

The following is extracted from a communiqué describing the recent battle for Warsaw.

AUG. 18th.—The Commander-in-Chief records with gratitude the intense and fruitful activities of the squadrons of the Third Flying Division, commanded by Major Fauntleroy. On the 16th these squadrons carried out 49 flights, which were most effective in holding up the advance of the enemy.

RUSSIA.

BOLSHEVIST COMMUNIQUE.

AUG. 19th.—Near Pultusk we brought down an enemy aeroplane. The aviator was killed, and we captured two machine-guns.

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McCudden's "Five Years in the R.F.C."	7s. 6d.	Blakeney's "How an Aeroplane is Built"	5s. 0d.
Richthofen's "Red Air Fighter"	3s. 6d.	Swinton's "£ s. d. of Flying"	6s. 0d.
Mortane's "Special Missions of the Air"	3s. 0d.	Sylvester's "Design and Construction of Aero Engines"	6s. 0d.
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The AEROPLANE AND GENERAL PUBLISHING Co., Ltd., 61, Carey St., W.C.2.

1912—1920.

AERIAL DERBY.

1912. Won by T. O. M. SOPWITH, Esq., on Bleriot Monoplane.
1920. Won by F. T. COURTENAY, Esq., on Martinsyde Biplane.

CELLON DOPE used on both Machines.

"The Dope of Proved" Efficiency.

IN MEMORIAM—CLIFFORD PRODGER.

On Aug. 23rd the evening newspapers announced that on that day three aviators had been killed in a crash from 300 ft. at a place called Redwood, California, and that one of the victims was Mr. Clifford Prodger, "of Bristol, England." The assumption is that this is the same Clifford Prodger who did such good work for British aviation during the war, though it is not clear why he should be described as "of Bristol," unless he happened to be in California on business for the American agents of the Bristol Aeroplane Company, for while in this country he never lived in Bristol and, to the best of one's recollection, never tested any Bristols. Despite this inaccuracy it is to be feared that the deceased aviator is in fact our old friend and ally.

Clifford Prodger may be reckoned among the pioneers of American aviation, for he learned to fly at Mr. George W. Beatty's school on Long Island, New York, just after the Chicago Meeting of 1911 or thereabouts, in the days of Hoxsey and Johnston. Before that he had been a cowboy in Texas, a life he had adopted because the doctors insisted that he must live in the open. Anything less like a cowboy than the dapper, almost dandified, man of the world whom we knew as Clifford Prodger it would be hard to imagine.

He came to England in 1915 when his old friend Beatty was running his very successful school at Hendon, and many of our best pilots of to-day owe their training to George Beatty and Clifford Prodger. It is recognised as an axiom that the man who can fly a Wright can fly anything, and it was natural therefore that Clifford Prodger should become a test pilot. After doing some testing on his own account he joined Mr. Bernard Isaac and formed the famous Prodger-Isaac combination, the first firm ever formed for the specific purpose of testing new types of aeroplanes, putting standard machines through their Government acceptance tests, and so forth. Mr. Prodger and Mr. Lankester Parker did the flying and Mr. Isaac made all the business arrangements, allocated the work so as to save unnecessary travelling and delay, and generally did all the organising, with his usual ability.

The result of this arrangement was eminently satisfactory, especially to the firms whose experimental tests were done by Mr. Prodger, for as a test pilot he was rather in the class of the late Peter Legh, in that he could fly a new type of machine and afterwards tell the designer not merely that it was wrong, but what was wrong and why it was wrong. There are many good machines to-day which owe their goodness to Clifford Prodger's faculty for discovering and curing aerodynamic and mechanical defects.

He came into the public eye chiefly as the pilot of the Handley Page biplanes, firstly when he took up 20 passengers on a twin-engined machine, and later when he took up forty on a four-engined machine. The feats of piloting these machines, however, were of no account when compared with the work which he did in causing machines to be capable of performing great feats. Anyone can fly a machine, but it takes a good man to get it properly into tune. When once he became known to the daily news-sheets his name frequently appeared therein as having made very long non-stop flights, as, for example, Belfast to Hendon, and Glasgow to Folkestone; but his best work was not the mere muscular work of long flights, it was the brain-work which he did in making bad machines into good, or good machines into better.

Particularly he was of great value in testing machines built by sub-contractors. Many of these were typically British, self-satisfied, self-complacent engineering or motor-making firms, who were quite convinced that none of these mere stick-and-wire aeroplane designers could teach them anything about engineering. And when their first attempts to build aeroplanes came out hundreds of pounds heavier than specification, or when the clumsy workmanship of the ham-fisted motor mechanic displayed itself, a few incisive words from Clifford Prodger in the picturesque idiom of the West, which he could use really well when he liked, did more to improve the next attempts of the sub-contractors than any amount of official paper could have done.

Personally Clifford Prodger was a bright, cheery little soul, whom it was always a pleasure to meet. He had most of the charming manners of the well-educated American, but he had a natural manner as well which won for him genuine esteem. He was in fact one of the best of the many good Americans who came over here during the war and who seem to have become so scarce since the war ended.—C. G. G.

AIRCRAFT IN PARLIAMENT

HOUSE OF COMMONS.

Aug. 16th.—The following oral answer was given:—

GERMANY (DISARMAMENT).

The PRIME MINISTER, in reply to Lt.-Col. Sir F. Hall, who asked the number of aircraft, heavy guns and small-arms surrendered by Germany since the Spa Conference, said: As the answer consists mainly of statistics, I shall, with my hon. and gallant friend's permission, circulate it in the Official Report.

* * *

The following is extracted from the answer referred to:—

With regard to aircraft, the latest figures, i.e., up to July 31st, are as follows: Number of aeroplanes and seaplanes surrendered, 128; number of aeroplanes and seaplanes destroyed, 813; number of airships surrendered, 1; number of airships destroyed, 1.

Sir F. HALL: Have any of these aircraft been handed over to this or any of the Allied countries since the Spa Conference?

The PRIME MINISTER: I think so. As a matter of fact, considerable progress has been made in that matter since the Spa Conference.

Sir F. HALL: Will the right hon. gentleman's reply contain the figures? It is of the utmost importance to have them.

The PRIME MINISTER: I think so.

Colonel WEDGWOOD: Have any of them been handed over to Poland?

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Aug. 17th.

ROYAL AIR FORCE.—SHORT SERVICE COMMISSIONS.—Flying Officer W. Chapman (T.) resigns his short service commn., and is granted rank of Capt., Aug 18th.

FLYING BRANCH.—Pilot Officer W. U. Ingram relinquishes his commn., March 3rd.

ADMINISTRATIVE BRANCH.—Flying Officer (actg. Flight Lt.) G. Roberts relinquishes the actg. rank of Flight Lt. on ceasing to be empld. as Flight Lt., June 2nd

TECHNICAL BRANCH.—Capt. E. Ball is placed on the retd. list, Aug. 18th.

MEMORANDUM.—Wing Comdr. J. St. J. Murphy (Surg. Comdr., R.N.), having retired from the R.N. and relinquished his R.A.F. commn., is granted permission to retain the rank of Lt.-Col., July 1st.

AIR MINISTRY, Aug. 20th

ROYAL AIR FORCE.—SHORT SERVICE COMMISSIONS.—Flying Officer S. G. Frogley, D.S.O., D.F.C. (A.), relinquishes his short service commn. on acct. of ill-health contracted in the Service and is granted the rank of Flight Lt., June 24th (substituted for notification in the *Gazette* of July 13th).

TECHNICAL BRANCH.—Lt. F. Ederett is placed on the retired list Aug. 21st.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATHS.

BUCHANAN.—Capt. E. Lawrie Buchanan (late R.A.F.), Assistant Irrigation Officer, who was killed in action on August 15th, at Shahraban, Mesopotamia, was the only son of the late J. B. Buchanan, A.M.I.C.E., Chief Engineer of Hyderabad Deccan, India, and Mrs. E. F. Buchanan, of 32, Elsworthy road, N.W., and 38, Percy Avenue, Kingsgate. He was 27 years of age.

COWELL.—Captain Sydney Cowell, stated to be an ex-R.A.F. officer attached to the Air Ministry, was drowned on August 22nd in the Thames off Eton College bathing place through his punt-pole breaking. Owing to wounds Captain Cowell was unable to swim very much. He was 23 years of age.

PINDER.—Capt. J. W. Pinder, D.F.C., British Army, was killed on August 16th, while flying from Rio de Janeiro to Buenos Ayres.

ENGAGEMENT.

GROVES—STEEN.—A marriage has been arranged, and will shortly take place, between Group Capt. P. R. C. Groves, C.B., C.M.G., D.S.O., R.A.F., eldest son of Mr. J. Groves, late P.W.D., India, and Mrs. Groves, and Suzanne, daughter of Mr. T. E. Steen and Mrs. Steen, of Christiania and 107, Rue de la Pompe, Paris.

MARRIAGE.

BROOME—LERMITTE.—At Great Horkesley, Colchester, on Aug. 17th, Capt. Frank Broome, D.F.C., A.F.C., was married to Miss Nancy Lermitte, daughter of the late Colonel Lermitte, secretary of the Essex and Suffolk Foxhounds. Capt. S. Cockerell, A.F.C., was best man and Dr. Chalmers Mitchell was also present.

BIRTHS.

CLARK-HALL.—On Aug. 16th, at Ferry Barns, North Queensferry, to Group Capt. and Mrs. R. Clark-Hall—a son.

WEIR.—On August 22nd, at 39, Malvern Road, Weston-super-Mare, the wife of Flight-Lieut. A. G. Weir, R.A.F.—a son.

COMING EVENTS.

AUGUST

25th, Wed., 26th, Thurs.—R.A.F. *v.* Army Cricket Match at the Oval.

SEPTEMBER

1st, Wed.—British Government Competition, Amphibian Competition at Felixstowe.

8th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva.

18th, Sun, 19th, Mon.—Schnieder Cup Race at Venice.

27th, Mon.—Gordon Bennett Cup Meeting at Etampes begins.

28th, Tues.—Gordon Bennett Cup Race at Etampes.

Last week.—Latvian Trade Fair, Riga, opens.

OCTOBER.

2nd, Sat.—Gordon Bennett Cup Meeting at Etampes closes

23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.

23rd, Sat.—International Aero Exhibition, Prague, opens.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes

2nd, Tues.—International Aero Exhibition, Prague, closes.

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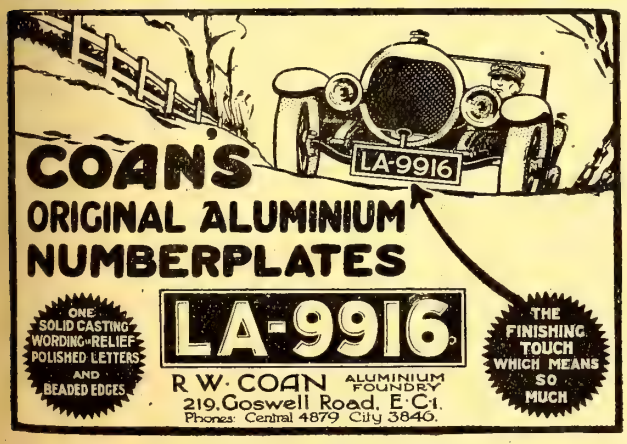

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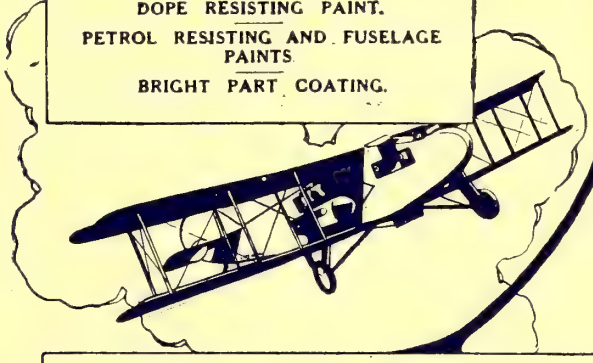

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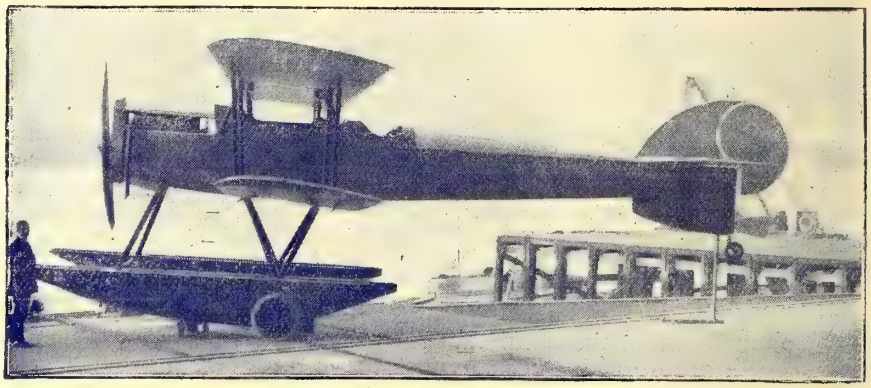

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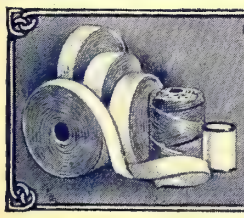

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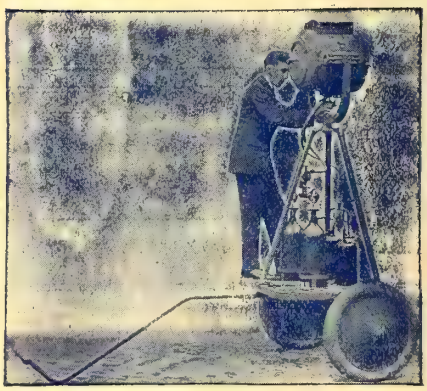

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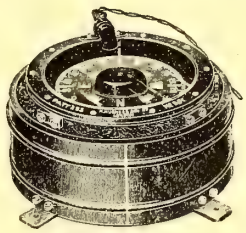

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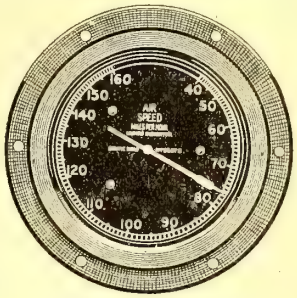

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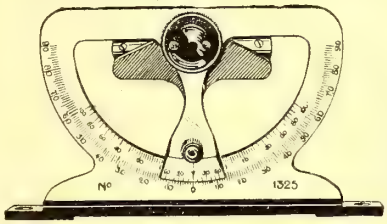

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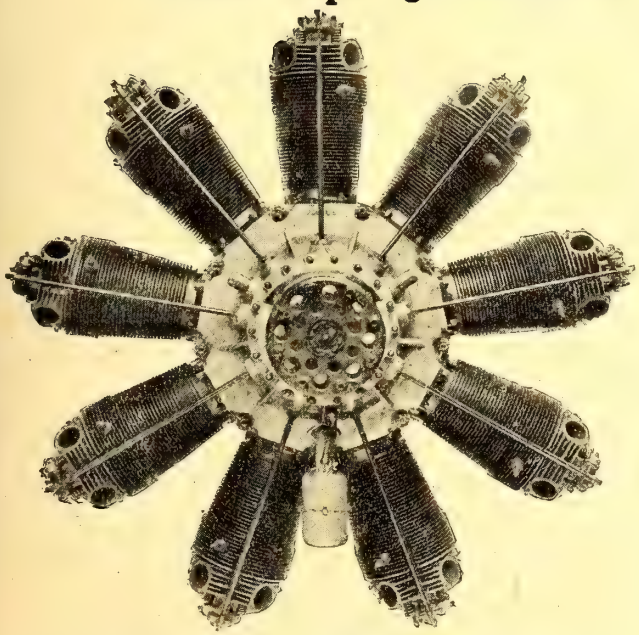

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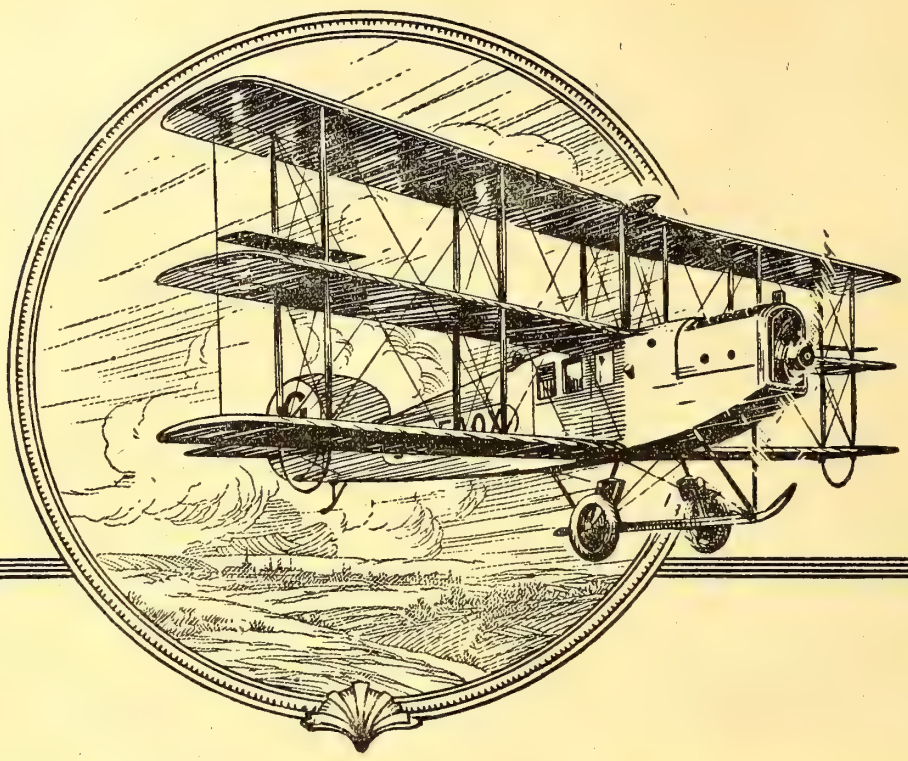

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ON THE AMPHIBIAN COMPETITION.

By the time these notes appear the Aeroplane Section of the Air Ministry Competition at Martlesham will have ended and the Amphibian Section will have begun. According to the rules the competing amphibian machines were to be delivered on Sept. 1st. One fears that there will be several absentees, for inquiries among the competitors by kindly officials extracted the information that some wanted the competition postponed to a later date, and that only one really insisted that as his machine was ready he was going to start doing the tests on Sept. 1st as per regulations.

It is a most curious fact that whether it is a question of a show, or a competition or a race—either for automobiles or aeroplanes—there is always somebody who is not ready in time and either rushes his vehicle through at the last moment or actually builds it on the scene of the contest. One is convinced that if the Amphibian Competition were postponed till September, 1921, or September, 1931, there would still be a certain number of aircraft firms in favour of a postponement. All of which shows that success does not depend on good work alone, but on doing that work in time and at the right time.

What the Amphibians Have To Do.

So far as the shore-going tests of the amphibians are concerned they are in kind precisely similar to those of the land aeroplanes. That is to say they include the High and Low Speed Tests, the Self-Controlled Flight, the Reliability and Economy (W/G) Test, and the Alighting and Getting-Off Tests.

For example, the Self-Controlled Flight will be a three-minute trial at 5,000 feet. (If the machine can get there, *bien entendu*). And "an official observer, a stop watch, and a recording barograph will be carried." An irreverent aviator suggests that the barograph is to measure to what amount the pilot (or rather lack of pilot) "puts the wind up the observer" during those horrible three minutes and the stop watch is for the purpose of measuring the observer's pulse.

Incidentally it is quite a pity that some of the high-browed medicine-men of the R.A.F. did not take an intelligent interest in the whole Competition. They might have obtained some very interesting results from tests of pilots and passengers, as for example the degree of fatigue in different pilots after the seven hours' reliability test, and the amount of nerve-jumpiness in observers after enduring the self-controlled flight, and the state of mind of "joy-ride" passengers in the big machines when two rival pilots (also joy-riding) started rushing round the cabin with fire-extinguishers looking for an entirely imaginary fire—as they did on one machine. How the late Louis Stamm would have enjoyed the opportunity.

Differences in Land Tests.

The chief differences between the tests for land aeroplanes and amphibians are as follows.

(*a*) The Reliability and Economy (W/G) Tests will be flown at a height between 2,000 feet maximum and 1,000 feet minimum instead of between 4,000 feet and 3,000 feet.

(*b*) Instead of a "Landing Glide," with the engine switched off and the pilot in control to put the machine on the ground without re-starting the engine, the amphibians will do a "Self-Controlled Glide," in which the engine will be throttled down or switched off at 5,000 feet and the pilot will leave the machine to control itself, taking his feet off the rudder-bar and his hands off the wheel or stick. But instead of landing the pilot will resume control "at any height below 4,000 feet." That is of course unless the machine is by then in a flat spin and "self-determines" itself.

(*c*) In the alighting tests the amphibians will come in over the balloons (commonly known as "Mutt and Jeff") tethered at a height of 25 feet, instead of at 50 feet as for the land machines.

(*d*) In the get-off test the machines will be allowed a run of 400 yards, instead of only 175 yards as for the land machines.

The Sea-Going Tests.

The sea-going tests of the Amphibians will take place at Felixstowe and are rather interesting. They include:

(*a*) Alighting and Getting-Off Tests, in which the machines will start from a buoy and pass as high as possible between two mark-boats 75 yards apart and 600 yards from the starting buoy. After which the machines will alight on Martlesham Heath. The get-off height on passing the mark-boats will be measured photographically. One is curious to see what the technical people will substitute for the fabric fence used on land to measure the height.

(*b*) A Taxi-ing Test, which ought to provide some entertainment.

(*c*) A Figure-of-Eight Taxi-ing Test, which ought to be still more entertaining.

(*d*) An Anchoring and Mooring Test, which sounds dull, but may be amusing, as anyone will realise who has seen a landsman's endeavour to tie-up a boat. The personnel of Felixstowe Air Station may think this the best of all tests.

(*e*) A Mooring-Out (Fair Weather) Test, which sounds still duller, as it merely means leaving the machine unattended and tethered to a buoy. Watching it would be even less exciting than the occupation of the Lancashire Bank-holiday-maker on Seacombe pier who sat watching the dredger working in the Mersey and swore that he would not come in to his tea till he had seen "the last o' them domned boockets coom oop."

(*f*) A Mooring-Out (Moderate Weather) Test, which might provide some amusement, especially if the Judges Committee relied on the barometer to say what was "moderate" and the weather, *more suo*, showed its contempt for the barometer in the customary manner.

(*g*) A Getting-Off and Alighting (Rough Water) Test. This should be the best of all the tests, but one is almost prepared to bet that there will be no "rough water" during the period of the Competition, September is almost always a fine month, and the equinoctial gales generally arrive early in October. Moreover, as the Competition demands rough weather it is practically certain not to get it.

To Defeat the Weather.

Therefore it may be necessary to make artificial rough water. This might be done by anchoring or mooring all the competing machines, except the one to be tested, in line abreast, starting all their engines, directing all the slip-streams of all their airscrews on to one space of water, and sending a couple of destroyers at top speed across this wind-swept space to raise a lop. The machine to be tested would be required to get off this rough patch within 30 seconds of the passing of the destroyer. The line of anchored machines would serve in place of the jumping-off screen used at Martlesham, and the height of the machine under test could be measured photographically as it passed over them.

The Air Ministry would supply petrol and oil and would insure personnel and matérial of all machines concerned. But if the competitors objected to being jumped over, then there are plenty of very good seaplanes and flying boats at the Felixstowe Air Station which could be used for the same purpose.

Of course the method suggested might prove expensive, for if there were a smash it would be a really good one. But the method would be quite in accord with the generous traditions of the Navy in such matters. It is quite time some sort of a Naval flavour was given to the Competition, for hitherto it has been run with that extraordinary combination of high efficiency and rigid economy which is characteristic of the Army.

If this suggestion for defeating the weather at vast expense is not adopted, readers may safely ascribe the mean attitude of the Air Ministry to the parsimonious influence of the War Office, owing to Mr. Churchill's holding the offices of War Minister and Air Minister at the same time. (Vide the *Times*, the Air League, and other agitators of a few months ago.) One feels sure that if the Handy (not to say, ham-handy) Men of the British Navy were let loose on the problem they would abolish it (and the competing machines) in a very few minutes. [Note.—When in doubt always blame the soldier.]

The Last Test.

(*h*) Finally there is a Towing Test. "Machines will be towed" (at a rate of knots, presumably) "by a motor-boat supplied by the Judges Committee. Competitors may provide their own towing tackle." This ought to be the last straw which breaks the back of the camel (not the Sopwith variety), but one fears that the motor boat will be manned by R.A.F. personnel and will be too well handled to make the test as valuable as it might be.

To be a proper test this should be made with Navy picket-boats manned by R.N. ratings from Harwich armed with one boat-hook and one heaving line per man. Then the constructor would be able to demonstrate whether his wings were proof against boat-hooks: whether his floats or hull were strong enough to resist puncture by boat-hook spikes and ramming by the bows of boats; whether his pilot could by purely verbal means protect his machine against being rammed, spiked and torn to pieces and himself against being lassoed, pulled out of his machine and keel-hauled by enthusiastic line-throwers; and whether the machine would tow equally well when attached to the picket-boat (1) by a line to an aileron hinge, (2) by a boat-hook stuck in an airscrew blade, (3) by a grappling hook dropped haphazard onto the tail-plane.

It would seem that the Judges Committee, which has hitherto performed its task irreproachably, is here missing an opportunity of making Civil Aviation popular with the Senior Service and of adding to the gaiety of nations. After all, these tests are intended to show what machines intended for Civil Aviation can do and endure. And amphibian aeroplanes which navigate to or round our coasts will certainly have to reckon with the well-meant attentions of the Handy Man. Therefore why not carry the scheme to its logical conclusion?

Having thus briefly indicated the nature of the Amphibian Competition, let us now proceed to the further description and a few final remarks on the land-going machines, whose tests are now ended. Some rather interesting points have arisen since last week.

THE LAND MACHINE TESTS (*Continued*).

The Switch-off Test.

On August 12th, the Vickers made the first attempt at a test specially invented for twin-engined machines, namely, switching-off one engine and flying straight with only the other working. In this test the machine is supposed to fly straight for five minutes without losing height.

Under orders from the official observer, Capt. Cockerell switched off his starboard (or right) engine, whereupon the machine tried to spin to the right under the pull of the port (or left) engine. The only way of keeping her straight was to put her nose down and do a mild dive so as to get up sufficient speed to give her enough rudder-control to overcome the pull of the port engine. In this way she dropped 2,000 ft. in 5 min. Which means that though one could do a long straight glide with the starboard engine out of action, one could not keep level.

Two days later, on the 14th, the same test was made with the port engine switched off. This time the machine not only flew straight, but climbed 500 ft. with the engine out of action. The reason is worth explaining.

A Matter of Slip-streams.

Both engines (Rolls-Royce "Eagles," of 375 h.p. each) run in the same direction, namely, anti-clockwise when one stands in front facing the tractor airscrews. That is to say, they are right-handed engines. Now, no slip-stream from any airscrew ever travels aft in a straight line. In this case the slip-streams screw off to the right (when one is standing in front of the screws). That is to say, the slip-stream from the starboard screw blows onto the rudders and the slip-stream from the port screw blows away from the rudders.

Consequently, when the starboard engine is out of action there is no slip-stream on the rudders, and as the speed through the air with one engine when flying level is not high enough to give the rudders control by themselves against the pull of the port engine, the machine will slew round to the right unless it is dived to increase the air speed. But, when the port engine is out of action the slip-stream blows direct onto the rudders, so that by setting the rudders over to the right it is possible to prevent the starboard engine from pulling the machine round to the left.

If the starboard engine were a right-handed engine (*id est* driving a right-handed screw) and the port engine were a left-handed engine (driving a left-handed screw), then it would be possible to maintain height with either engine out of action. It was originally intended that twin-engined machines should have "opposite-hand" engines, but having to make opposite-hand camshafts so delayed production, and stores officers used to get so hopelessly mixed between "starboard engines," "right-hand engines," "right-handed engines," "anti-clockwise tractor engines," "clockwise pusher engines," and their various opposite numbers—all of which turn on the perfectly plain definition that "a right-handed engine is one which turns an ungeared tractor airscrew as a right-handed screw"—that squadrons generally received precisely the engine which they did not want. So the Supply Department gave it up as a bad job, and all engines became right-handed. *Hinc ulæ lachrymæ, Facilis est descensus*, etc.

Anyhow, the Vickers put up a very good show, and thanks to Captain Cockerell's skill she did not fulfil the expectations of some of the onlookers, one of whom came up before the start for the test and remarked: "Ever seen a 'Vimy' do a spin?" One replied that such a fearsome spectacle had not been within one's experience, and asked, "Why this horrible suggestion?" "Oh! Merely that Cockerell's going up to

do the switch-off stunt," was the reply. A cheerful lot are these pilots—but they did not see that spin.

The "Mutt and Jeff" Tests.

Perhaps the tests which caused the greatest amusement of all were the landing tests on the early morning of August 14th. This test is arranged on the idea that the unfortunate or foolish aviator is going to try to get into a field 175 yards across and surrounded by 50-ft. trees—the same field from which he is supposed to start in the get-off test. Even the ingenuity of Major Barlow and his technical staff failed to arrive at a scheme by which a pilot could be told photographically when he was over an imaginary 50-ft. tree, so they were reduced to inventing a visible but harmless obstacle over which the machines could scrape in their descent.

Consequently the trees were represented by a row of toy balloons filled with gas, and anchored in pairs along the edge of the 175-yard imaginary field. The pairs of balloons were tethered to two light threads fixed to the ground at points some distance apart so as to stop them from swaying in the light puffs of early morning air. And, because they were in pairs and looked funny, naturally the comic Nares christened them "Mutt and Jeff." Each pair was separated from the next pair by a space which was just narrow enough to make it impossible for a machine to squeeze through without touching a balloon on one side or the other.

The two first competitors to attempt the test, which was wisely left till last of all, in view of the risk of damage, were Captain Hamersley on the Avro triplane and Mr. Hawker on the Sopwith "Antelope." The Avro's first attempt resulted in her running well outside the 175-yard limit and fetching up, after a rather bumpy landing, at a point 239 yards from the balloon line. Which was really a very good performance considering that she carries a biggish load and that a triplane is not best suited by a "pancake" landing, seeing that the bottom plane blankets the middle plane, which in turn blankets the top plane.

Mr. Hawker's landing came very near the mark, as he finished 187 yards from the balloon line, and so only 12 yards outside the desired limit. In the course of one attempt he caught one Mutt-and-Jeff under his wing, but they trickled out behind without bursting. In that case the attempt was not counted as, theoretically, he had touched the tree-tops.

Captain Hamersley's next effort brought him to a standstill in 221 yards. But unfortunately the landing was more bumpy than usual, and when the machine stopped it was seen that one of the rear struts of the undercarriage was badly bent. As the machine was in the way of Mr. Hawker's next landing it was hauled to one side, and everybody stood by to see the Sopwith land.

The Humours of Landing.

Now, the "Antelope" is fitted with brakes on her main landing wheels, and with two small wheels in front to keep her from pitching onto her nose. Mr. Hawker came in with his brakes well on, landed, bumped, and then there were three loud reports, one after the other, and it was seen that both his main tyres and one of the small tyres had gone pop.

What had happened was that the pin which held the main axle from revolving inside the torque-rod casting had sheared through the casting, which was of aluminium, the axle had twisted round, taking the brakes with it, and the Bowden wires had held and locked the brakes solid, with the result that the tyres had been wrenched off bodily, throwing the machine up and sideways onto one front wheel, from which the tyre was also wrenched. But the machine had come to a stop in 173 yards, the only one in the competition which did so. Unfortunately this attempt did not count as the machine did not land intact.

Naturally everybody crowded round, laughing, to inspect the tyres, and while they were doing so there was a groan and a crash, and the Avro, which had been standing all by herself, sat down flat on the belly of her fuselage. Apparently she was so shaken by emotion at seeing the Sopwith's adventure that she shook herself off her damaged undercarriage.

Hardly had people done laughing at the Avro when an R.A.F. pilot on a single-seater, who had nothing to do with the Competition, and had *not* been trying to land over Mutt-and-Jeff, alighted not far away and completely wrote off his undercarriage also. And thus there were three machines sitting peacefully on the aerodrome in the morning sun, two with undercarriages utterly deleted, and one badly damaged. Quite a good morning's work, which reminded the happy pilots of the good old days when there was a war, and they could smash as many machines as they liked without any silly old owner objecting.

The same day the Vickers did her landing test and pulled up in 308 yards, which was not by any means bad for a big machine, which was allowed 275 yards by the rules. It is of interest to note that Mr. Keep, who did his landing test on the 17th, pulled up in 235 yards, or a trifle less than the Avro, and about 50 yards more than the Sopwith. Evidently he was not taking any chances. Having done so well in all the other tests he could afford to lose a little on the landing.

Alleged Ill-Luck.

For the first ten days the Napier-engined Handley Page (W.8) was immobilised through having damaged an airscrew. She was ready with new screws on Friday the 13th, and made her trial flight on that day—supposedly unlucky. Major Brackley, a wonderfully fine pilot, took her off like a rocket, and, flying light, she showed astonishing climb and speed, though her length and span suggest that she would not manœuvre as handily as the short tubby Vimy. She was only given her trial that day and was then put away to fill up for her Reliability Test next day.

On this alleged unlucky day Mr. Hawker got off over the screen at a height of 23 ft., which was the best on record. And Mr. Keep did a high speed of 117 m.p.h. on the Westland, which was also a record. Furthermore, he did a low speed of 46 m.p.h., which gave the record range of speed between high and low. Over and above which the Bristol did her low speed test. So it did not seem so unlucky, after all.

The Handley Page Luck.

The real bad luck came next day. Major Brackley started for the Reliability Test in the morning, and after 2½ hours' flying came down because the trailing edge of the port upper plane showed signs of giving way. On examination it was found that the fabric was stripping off the top of the plane, where it could not be seen from the body of the machine.

The stripped portion was exactly in the path of the slip-stream of the port airscrew, and was undoubtedly caused by the beating of the slip-stream causing a vibrating suction on the upper surface just aft of the rear spar. This rather seems to indicate that the screws are not highly efficient, for presumably if a screw were 100 per cent. efficient there would be no slip-stream at all, and the less efficient the screw the greater the amount of slip-stream.

Apropos the Handley Page, a story is told which is worth retelling for the quaintness of the idea. A resplendant R.A.F. officer was standing by the machine, in beautiful field-boots and many medal-ribbons, when a fair dame came along, accompanied by a lap-dog, and began asking questions. Glad to have an opportunity of being useful and polite, the R.A.F. officer explained the whole outside and most of the inside of the machine to her. But while he was doing so the dog seemed to be consumed with admiration for his field boots.

He kept on dodging round the dog till finally the lady noticed it and remarked, kindly, "Please don't be afraid. He won't bite you." To which the R.A.F. officer replied, "Oh, no! madame, I'm sure he would not; but from the way he was handling his leg I was afraid he was going to kick me."

The Crowning Blow.

However, that has really nothing to do with the Air Ministry Competition, so to proceed.—The accident to the wing finished all the work for Saturday the 14th, and most people went away for the week-end. On Monday the Handley Page crew started to re-cover the wing, and by working very hard they got it done at night ready to start in the morning. It was all finished and the men were climbing down from the high trestles on which they were working when one of them slipped and fell bang through the lower plane, breaking two ribs.

If they had been his own ribs nobody would have minded, but unfortunately they were the W.8's. The man himself vanished, and according to rumour from Martlesham he has not been seen since. Opinion locally is said to be divided between three theories: (A) That he vanished in a cloud of steam and small stones down the road to Ipswich and safety; (B) That he was torn into such small pieces by his mates that no part of him remains to be identified; and (C) that he is still up at the top of the tallest of Colonel Pretyman's trees, afraid to come down for fear of being murdered.

Be that as it may, the rest of the crew had to set to work and labour all night to repair the lower plane. So well did they work that all was ready in time, and so Major Brackley was able to start for the Reliability Test. That the job was well done is shown by the fact that later on he put up the record speed of the Competition, namely, 118 m.p.h. Also in the Get-off Test he cleared 74 feet with a 275 yard run. And he pulled up in 263 yards in the Landing Test. Truly a wonderful performance.

A Terrible Threat.

Some odds and ends of gossip have drifted Londonwards since one left Martlesham, among them being a rumour of an argument that very nearly meant doing all the tests over again.

One or two firms, who thought that they might do better than they have done, suggested that they would apply for a revision of the Certificate of Airworthiness granted to their machines. This, if granted, would mean that the machine would be licensed to carry a bigger load (W.) than it actually

carried in the tests. Which would mean an increase in the W/G figure, assuming that the petrol consumption (G.) remained the same. But the opponents insisted that if W. were greater, G. would become greater also—which, one imagines, it would, only the increase might vary in proportion in each machine.

The only way of proving the argument would be to fly through the tests again. So ultimately the threat was removed. The obvious argument against a revision is that if the firms thought their machines could carry more they should have said so when the Certificate was granted.

Doubtful Results.

The Judges' Interim Report, giving the results on marks awarded, will probably be published this week. Betting in each class is at very short prices. The Westland and the Sopwith are very close together in the Small Class, and the Vickers and the Handley Page are very close in the Large Class.

The Westland beats the Sopwith on performances, but there are 35 marks out of 100 to be got for "general features," such as fire protection, petrol and oil systems, simplicity of design and accessibility of parts, field of view, comfort (including warmth, ventilation, arrangement of controls, etc.), freedom of entry and exit, effectiveness and lightness of controls in the air, and other points. Each machine has to be flown by an Air Ministry test pilot, and the pilot who flew the Westland reported that she did not obey her ailerons as well as might be. This is a matter which is very easily improved, but, of course, each machine has to stand or fall by what it is at Martlesham and not by what it will be after slight alterations. So she may lose a few marks on this point and the Sopwith may gain a few. Anyhow, there is a very small margin either way.

Similarly the Handley Page beats the Vickers, good as the latter is, on performance. Her speed and get-off and W/G figures beat anything in the Competition. But the mishaps to her wing is bound to count against her, and there are said to be other points on which the Vickers scores. So they two will come out very close together.

Sundry Matters.

The Beardmore was definitely withdrawn last week. Captain Hamersley made a short flight with her, after a new radiator had been fitted, but, according to Martlesham rumour, "somebody had mislaid the centre of gravity," chiefly

TABLE OF RESULTS TO AUGUST 31st.

Machines, Engines and Pilots.	Date of Beginning Trials.	Weighed.	Examina'n.	High and Low Speed.	Reliability (7 hours) and Economy.	Self Controlled Flight.	Stopping of one Engine.	Landing (Glide).	Wind Test.	Landing and Getting Off.
*Central Aircraft Co. "Centaur 4." Two 160 h.p. Beardmores. (F. B. G. Castleman).	(Competing "Hors Concours" as not complying with conditions of Competition.)			H.S. 21/8/20 88.9 m.p.h. / L.S. 48.03	$\frac{W}{G}$ = 9.18 But at 63 m.p.h. with 360 miles' fuel.	Succeeded.	Lost height but retained control.	21/8/20		Get off—Failed to clear screen. / Landing 281 yds
Handley Page Ltd "W.8." Two 450 h.p. Napiers. (Major Brackley).	14/8/20			H.S. 21/8/20 118.5 m.p.h. / L.S. 55.35 2nd trial 55.2	accepted 18/8/20 / $\frac{W}{G}$ = 9.3	Succeeded.	Maintained height with each engine.	21/8/20		Get off 74.1 ft. / Landing 263 yds
Vickers Ltd. "Vimy." Two 375 h.p. Rolls-Royce. (Capt. Cockerell). (Capt. Broom).	4/8/20	4/8/20		H.S. 11/8/20 102.73 m.p.h. / L.S. 11/8/20 49.63 m.p.h.	accepted 7/8/20 / $\frac{W}{G}$ = 6.33	11/8/20	Starboard 12/8/20 failed. / Port 14/8/20 succeeded	11/8/20		Get off 12/8/20 26.45 ft. / Landing 14/8/20 308 yards.
Austin Motor Co., Ltd. 160 h.p. Beardmore. (M. D. Nares).	4/8/20	4/8/20		H.S. 6/8/20 109.96 m.p.h. / L.S. 9/8/20 45.1 m p.h.	accepted. / $\frac{W}{G}$ = 2.97	5/8/20		5/8/20		Get off 16/8/20 13.18 ft. / Landing 244 yds
W. Beardmore & Co., Ltd. 160 h.p. Beardmore. (G. Powell).	7/8/20	7/8/20		Withdrawn by the Manufacturers.						
Bristol Aeroplane Co., Ltd. 240 h.p. Siddeley "Puma." (C F Uwins).	3/8/20	3/8/20		H.S. 7/8/20 108.3 m.p.h. / L.S. 13/8/20 49.07 m.p.h.	accepted 12/8/20 / $\frac{W}{G}$ = 2.22	16/8/20		12/8/20		Get off 16/8/20 19 27 ft. / Landing 24/8/20 313 5 yards.
Westland Aircraft Works. Limousine. 450 h p. Napier. (A. S. Keep).	6/8/20	6/8/20		H.S. 13/8/20 117.7 m.p.h. / L.S 13/8/20 46.05 m.p h.	accepted 12/8/20 / $\frac{W}{G}$ = 8.65	12/8/20		12/8/20		Get off 12/8/20 22.75 ft. / Landing 17/8/20 235 yards
A V. Roe, Ltd. Triplane 240 h.p. Siddeley "Puma." (Capt. Hamersley).	3/8/20	3/8/20		H.S. 4/8/20 95.7 m.p.h. / L S. 12/8/20 51.5 m.p.h.	accepted 7/8/20 / $\frac{W}{G}$ = 3.63	(Failed).		4/8/20		Get off 12/8/20 1.18 ft. / Landing 14/8/20 239.1 yards.
Sopwith Aviation Co., Ltd. "Ante ope." 180 h p Wolseley "Viper." (H. G Hawker).	3/8/20	3/8/20		H.S. 6/8/20 110.35 m.p.h. / L.S. 12/8/20 43 m.p.h.	accepted 4/8/20 / $\frac{W}{G}$ = 4.3	6/8/20		5/8/20		Get off 13/8/20 23 ft. / Landing 14/8/20 187 7 yards.

* The Central Aircraft Co.'s machine is flying *hors concours* as she is unable to hold petrol for 450 miles in the tanks at present fitted.

[NOTE.—The letters $\frac{W}{G}$ in column six of the table above indicate a measure of the efficiency of the machine and engine combined. W = the weight in pounds of useful load (either passengers or goods) carried on the Reliability Test, over and above the pilot (and mechanics, if any) and petrol and oil for 3½ hours' flying—approximately London to or from Paris against any ordinary wind. G = the number of gallons of petrol actually consumed in the course of the two 3½ hour flights, or seven hours' flying in all, at a cruising speed of 80 m.p.h.

Thus $\frac{W}{G}$ represents the weight of useful load carried by one gallon for seven hours at 80 miles an hour. From this figure one can arrive at any other figures of costs desired, such as ton-miles per gallon, or ton-miles per penny. Thus a $\frac{W}{G}$ of 8 would indicate that one gallon would carry 8 lb. to Paris and back in that particular machine, or 16 lb. to Paris only, at 85 m.p.h. Which would mean, at 4s. per gallon for petrol, a cost of 3d. per lb. for fuel alone.—C. G. G.]

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it was said, owing to some peculiarity in the wing section. This can be cured without much trouble, and one hopes to see this very interesting specimen of metal construction flying well ere long.

The Avro triplane refused to fly "hands and feet off," not having been designed to be inherently stable, and so could not fulfil the complete series of tests. This also is an easy matter to remedy, if a purchaser wants an inherently stable triplane, and it is not every aviator who likes a stable machine.

The "Centaur" (Central Aircraft Co.) could not get over the screen with a 275-yard run in the get-off test, which was natural seeing that she had only 320-h.p. for a seven-passenger machine. But for short-distance work with fewer passengers she is a very nice specimen of a low-priced twin-engined craft, as the figures on the table show.

At the moment of writing the Austin "Kestrel" had not finished all her tests, but on performance so far as she has gone she ought to have a close fight with the Bristol for third place in her class.

Finally.

That is all that one can say about the Aeroplane Competition of one's own knowledge. One has, at any rate, it is hoped, given readers some idea of how the various tests are flown and of the very thorough and yet friendly way in which those in charge of the tests do their work in relation to the competitors.

The tests for the Amphibians, now in progress, are of a very similar kind in so far as the shore-going part of the work is concerned. Weather permitting, and assuming that the competitors are ready, one hopes next week to be able to give some account of the amphibians on both land and water.

Meantime, those who are more interested in the purely land-going machines will find in the table which is published herewith the final figures obtainable until such time as the official report is published. Even the official report can scarcely give all the information which one would like to have on this subject, and if one might make a suggestion it is that the Royal Aeronautical Society and the Institute of Aeronautical Engineers might invite some of those who have been concerned with the Competition to read papers on the methods in which the tests were made, on deductions from the results, and such subjects.

The lessons learned from these tests cannot be too widely known to all who are concerned with the progress of aviation, whether as designers, constructors, or users. And the more widely those lessons are taught the better will be the value received by the British Taxpayer for the £64,000 allocated as prizes for the Competition.—C. G. G.

LLOYD'S AND AVIATION.

The surest indication of the increasing stability of aviation is the close interest taken by Lloyd's in the new science. Shipping, comparable in its general attributes with aerial transport, is controlled to a large degree by the action of Lloyd's, whose registers and system of registration has done much to reduce the risks of sea-travel. The importance of the following communique issued by Lloyd's to the Press will therefore be realised by all who have the interests of aviation at heart:—

The Committee of Lloyd's, recognising the growing importance of Aviation Insurance, established some time ago a Sub-Committee on Aviation assisted by a Technical Committee. The membership of the committees include representatives of the Air Transport companies, aircraft constructors, and underwriters.

It is clear, on the one hand, that enterprise in connection with Civil Aviation would be greatly assisted by adequate insurance facilities; on the other hand, these facilities cannot be provided unless certain essential information is collected and recorded in an available form. The establishment of a Lloyd's Aviation Record has therefore been approved.

The first part of the Record will be shortly issued to subscribers, bearing information in respect to aircraft and pilots, and it is intended to follow this with further information as to technical personnel, aerodromes, alighting waters, air routes, foreign laws, etc.

The scope of the Record will be international, and steps are being taken to establish Lloyd's aviation agents and surveyors at home and abroad.

While those desirous of securing information afforded by the Record will be required to subscribe to its maintenance, it is not the intention to make it more than self-supporting.

It is the policy of the Committee in establishing Lloyd's Aviation Record to create facilities whereby constructors of aircraft, air transport companies, and underwriters of aviation risks may equally benefit, and, furthermore, it is thought that the benefits arising should tend to assist in the development of Civil Aviation.

Every effort will continue to be made to secure in the committees responsible for the maintenance of the Record an adequate representation of the various aeronautical interests involved.

Pilots desirous of being enrolled on Lloyd's Aviation Record may apply for a form of application to the Secretary, Lloyd's, Royal Exchange, London, E.C.3. Similarly, owners of aircraft who may wish to ensure correct information as to their aircraft now being placed upon the Record may procure the necessary form from the same source. Upon return of the form properly completed, the information contained therein will be recorded free of charge.

[Lloyd's Sub-Committee on Aviation is now composed as follows:—Chairman: Sidney A. Boulton (chairman of Lloyd's); E. E. St. Quintin, P. G. Mackinnon, A. L. Sturge (Committee of Lloyd's); H. Barber (Aviation Insurance Association); Lieut.-Colonel C. E. C. Rabagliati (White Cross Aviation Insurance Association); A. Newman (Union Insurance Society of Canton, Ltd.); Lieut.-Colonel W. A. Bristow (Ogilvie and Partners, Ltd.); Capt. P. D. Acland of Vickers, Ltd., and C. V. Allen, Secretary of the S.B.A.C. (both representing the Society of British Aircraft Constructors); Maj.-Gen. Sir W. S. Brancker (Chairman of Aerial Transport Section, S.A.B.C.); Admiral Sir E. F. Inglefield (Sec. of Lloyd's); Capt. H. R. Gillman (Sec., Lloyd's Aviation Record).

UNAVAILING REGRETS.

As will be seen in the Official Notices of the Royal Aero Club, published in their usual place in this paper, the Racing Committee regrets "that up to the present no British entries have been received for the Jacques Schneider International Seaplane Race to be held at Venice on Sept. 19th."

Somehow one is reminded of the dog of Mr. G. W. Hunter, a famous comedian of some twenty-five years ago. Mr. Hunter used to relate a long comic story about his dog, "a great entomologist," and, describing other of its peculiarities, used to say, "He goes out and eats things that disagree with him and then comes into my room and regrets it." That seems to be about the state of the Royal Aero Club. When it was called upon to organise the Schneider Cup Race at Bournemouth a year ago it apparently bit off more than it could chew, and now it feels sick about the consequences.

If the race at Bournemouth had been properly organised it would have been a gift for one or other of the British machines. The Trophy would have remained in England. The race would have been held here this year. And there would have been no lack of entries. As it is the impoverished Aircraft Industry does not feel justified in going to the expense of sending machines all the way to Venice. Nor does it feel inclined to spend money on building racing freaks like the Savoia and Macchi boats, which perform wonderfully off the glassy waters of the Adriatic, but would be perfectly unusable on a real sea. But there is, certainly, another side to the story, which is worth considering.

One is told that some firms offered tentatively to send machines to Venice if the Royal Aero Club would pay the expenses of the machines and their crews. The Club refused to do so on the grounds that its job is to promote sport, not to subsidise the Aircraft Industry. But, by way of a compromise, the Club offered to put up three prizes for British competitors who might complete the course.

As there would be only three British representatives this would mean a prize for each, and one believes that the lowest prize would have been large enough to cover transport costs, if nothing more. In other words, any firm which had sufficient confidence in its machine to be willing to back it to stay the course would be sure of having its expenses paid. Unfortunately this offer does not seem to have been sufficiently tempting.

There is yet another side-issue. One firm at least was willing to send a machine to Venice, but in some way or another the conditions of the competition were altered, with the consent of the Royal Aero Club representatives, but without consulting the firm in question. And as the altered conditions do not suit the said firm's existing machines, and as the firm will not build a machine to fit the altered conditions, no machine will be sent.

And so, apparently, Great Britain will not be represented in the great International Seaplane Race, although admittedly we make the best seaplanes in the world.—C. G. G.

TO PILOTS AND MECHANICS.

Pilots who are out of work will do well to consider the proposition offered by Lieut.-Col. G. L. P. Henderson for flying in Sweden. He wants two pilots, as well as two Beardmore engine mechanics and an Avro rigger, for a new mail line in Northern Sweden The pilots must be equally well qualified to fly boats, seaplanes or land machines, and must also be well up in all the mechanical details of aeroplanes and engines. The pay of the pilots will be £15 weekly and travelling expenses extra. Further particulars will be found in the advertisement columns of this issue.

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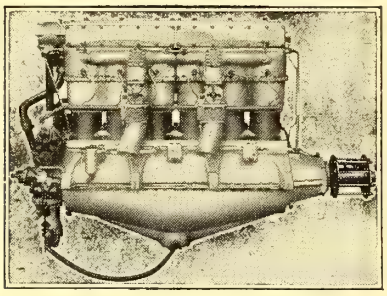

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THE WEEKLY COMMENTARY.

The first of a series of articles dealing with the history of the application of wireless signalling to aircraft purposes appears below. In this the author at first attempts to indicate the nature of the hindrances to the development of this branch of applied science which were added to the really serious technical difficulties by the absence of foresight and of imagination on the part of the authorities concerned.

During the late war, on the side of the Central Powers, Germany held a position of outstanding importance in all branches of warfare which cannot be compared to that of any of the Allies. This was certainly the case in aerial warfare, and hence to many minds enemy aircraft and German aircraft were practically synonymous.

It is therefore worth while to remember that, despite their inferior numbers, Austrian aircraft did exist, and in some respects showed very distinct technical merit.

For this reason the notes on Austrian aeroplanes contributed to this issue by Mr. Hildesheim should be found of considerable interest.

A HISTORY OF THE DEVELOPMENT OF AIRCRAFT WIRELESS.

I.—Pre-War Conditions and Experiments.

Before attempting to discuss those particular technical problems which have always been associated with the development of aircraft wireless, it is advisable first to consider briefly some of the broader practical difficulties which confronted the original investigators in this field of science. No individual branch of engineering science is ever completely free from certain non-technical problems which effectively impede the efforts of the most ambitious technical workers, and the extent to which this applies to the earlier advancement of aircraft wireless is rarely, if ever, given due recognition. Many previous writers on this subject—whose chief common characteristic would appear to be a desire to display a scientific knowledge which they do not possess—have succeeded in ascribing a totally disproportionate importance to the technical problems which occupied the initial stages of investigation.

The Absence of Foresight.

Previous to the war, in accordance with our amazingly myopic policy on the question of State subsidy for the encouragement of scientific research, no real progress had been made in this country towards the application of the principles of wireless telegraphy to the purposes of aviation. The declaration of war in August, 1914, found us still in the earliest experimental stage of this intricate branch of science, which ultimately proved of such vital importance to our success, whilst the Germans had already done a good deal of serious work and were considerably ahead of us. This deplorable stinginess, however, was by no means the most important factor which conduced to retard the development of aircraft wireless.

A much more potent influence in this direction directly emanated from the circumstance that aircraft wireless was what may be termed an unexplored sub-science of the equally new and unexplored parent science of aeronautics. Its progress depended essentially upon the expansion and development of that large field of activity which it was specially designed to serve. To a small extent, this circumstance contains an analogy to the problem of evolving an efficient brake for a new high-power engine whose exact speed has not yet been determined by trial. In the case of aerial wireless and aeronautics the problem was far more complex because neither incipient science could call on any great store of useful practical data accumulated from past experience.

In addition to this fundamental difficulty of circumstance, a great deal of harm was done to the cause of aircraft wireless in the early period of its development by the prevalence of the imbecile opinion amongst many "higher officials" that wireless telegraphy in any shape or form was nothing more than a humorous fetish that haunted the "unpractical" minds of a few scientific enthusiasts. The deadly idiocy of this attitude has, of course, been amply illustrated by the achievements of recent years; its baneful influence still lingers, however, and it is pathetically amusing to trace its existence in the four-a-penny theories of present-day writers on aeronautical subjects.

Again, there always existed the "danger element" in connection with those early experiments on wireless transmitters for aircraft. In justice to those enterprising workers who engaged in this search for the ideal transmitter, it must be stated that no individual regard for their own personal safety was ever known to influence the trend of their efforts. The element of danger was always there, however, and other factors had to be considered besides that of personal safety.

Following the outbreak of war, circumstances demanded the strictest economy of time, effort and material, and all sensible precautions had to be employed. In spite of this, it is true that the danger element was frequently exaggerated to an inexcusable degree by ill-advised, non-technical people, who did not hesitate to use it as a cloak to conceal the ignorant prejudice which crippled their fair judgment.

The Fire Risk.

The main source of danger in a wireless transmitter lay in the possibility of a fire being caused either in connection with the electric spark discharge, or through the "short circuiting" of "live" wires connected to the instrument. In the former case, the probability of such an occurrence was always exceedingly remote, the spark-gap being enclosed and efficiently insulated in a stout box or metal casing, which thus effectively shielded the spark from the structural material of the machine.

The latter was a more likely source of trouble, particularly in the case of wires which ran in close proximity to the petrol tank or any part of the machine in which petrol was likely to be splashed in the course of filling the tank. Numerous instances are also recorded of fires caused by fused wires coming in contact with the celluloid containers of batteries which were carried with certain types of transmitters.

It will be readily admitted that none of these possible causes of fire (which will continue to exist for all time in a modified form) can be attributed to any inherent inefficiency in the design of the wireless apparatus. They indicate, rather, a problem which demands the closest attention in the training of personnel in all branches connected with practical aerodrome work.

Some Real Difficulties.

Coming now to the more tangible limitations that impeded the application of wireless principles to the needs of aviation in the early stages of investigation, the following facts present themselves for recognition:

(1) Although the wireless principles involved were identical with those employed in the numerous ship and shore wireless stations then in existence, the experiments which led to the design of these latter powerful instruments were never influenced to any appreciable extent by consideration of size, shape or weight.

(2) On the other hand, nothing was of such vital importance in the design of aircraft wireless instruments than that, consistent with the needs of power and range desired, they should be (a) as light as possible; (b) ex-

ceedingly small—in fact, of miniature dimensions—and (c) of convenient shape (to a minor degree).

(3) The conjunction of these two circumstances emphasises the fact that, so far as the design of instruments was concerned, a very scanty legacy of constructional data was bequeathed to the pioneers of aerial radio-communication.

The effect of these restrictions manifested itself undeniably in the results which the earlier instruments yielded, and all subsequent efforts in this sphere of wireless activity were devoted to increasing the power of the transmitter and the sensitiveness of the receiver within the limitations imposed.

Early Naval Experiments.

In 1912 a number of half-hearted experiments were carried out by the flying branch of the Royal Navy in connection with a "plain aerial" transmitter for use in aircraft. This was an "untuned" instrument—i.e., one which did not concentrate all its energy on one particular wave length, but which so distributed its energy over different wave lengths that numerous receiving stations tuned to different waves could receive the same signal.

The primary energy for this induction coil transmitter was supplied by a local battery and, under favourable conditions, a range of a few miles was obtained. In the same year, the most satisfactory transmitter yet seen in this country was introduced by a Frenchman, whose name it bears—the Rouzet transmitter.

The Rouzet Transmitter.

The first tests carried out in this country with the original Rouzet ¼ kw. transmitter (weighing 100 lb.) were made from a triple tractor aeroplane. Subsequently numerous alterations and improvements in weight and general efficiency were effected, and at least half a dozen individual designs of this instrument were employed during various periods throughout the war. No useful purpose would be served, however, by considering the detailed construction of these incidental variations on one particular form of apparatus, and if choice is to be made of any one design for close consideration, it is advisable that the most recent pattern be chosen.

The reason for this is that, although the improved type of Rouzet transmitter was extensively used in aircraft throughout the earlier part of the war, the general *theme* of its construction did not vary essentially from that of the earliest pre-war type. Furthermore, owing to the numerous and rapidly succeeding changes in design and equipment which characterised the progress of aerial wireless during the period of the war, space will not permit a further allusion to this particular instrument in subsequent articles.

In the most successful form of Rouzet transmitter the total weight, exclusive of drive, was 75 lb., and the various components of the installation were arranged in a compact and convenient form. The necessary electric power was provided by a small self-exciting alternator, driven by a specially insulated clutch which provided an easily accessible means of stopping and starting the generator.

The output of the generator at 4,000 r.p.m. was rated at 0.4 kw. Leads were taken from the armature windings to both slip rings and a commutator from which excitation current was drawn at a normal rate of 0.3 amps. Under full load the machine heated up gradually during the first half hour of running, after which it remained at a steady temperature in the neighbourhood of 45 deg. F. In order to facilitate cooling as far as possible, a metal fan was fitted to the shaft, which maintained a constant draught around the armature.

The transformer for this transmitter took the form of a closed magnetic circuit, which consisted of a rectangle of soft iron laminations with a common centre arm, around which the windings were placed. The primary, which contained 480 turns of wire, was wound around the iron, and was enveloped by the secondary, which consisted of three series-joined sections, each containing 12,900 turns of special aluminium wire.

Choke coils were also provided which were specially insulated to withstand the high-tension voltages for which they were designed. The condenser used was of the Dubilier type, with a capacity of approximately 1.8 jars, and capable of dealing with a pressure of 30,000 volts. This instrument was composed of the usual copper foil plates and micanite separators, the whole being sunk in paraffin wax and enclosed in a wooden box.

The Rotary Spark Gap.

The main feature of the Rouzet set was the rotary spark-gap which it employed. This was composed of an insulated disc (which was fitted to the generator shaft and rotated with it), carrying 24 studs of an aluminium alloy, joined together in pairs. These studs moved parallel to another fixed system of studs fitted to an insulated sector which was situated immediately opposite the revolving disc.

This is represented in Fig. 1, in which E is the sector, the disc being marked D. It will be obvious that the spark, which takes place between these two systems of studs—one fixed, the other rotating—will get several opportunities per revolution of crossing the intervening air-space. The high spark frequency which this allowed resulted in the emission of a correspondingly high musical note, which always lends itself readily to detection by the human ear.

A method of directly coupling the aerial circuit and the condenser circuit, and of varying the wave-length of the latter, was provided by the spiral inductance which was placed above the generator. This contained about 12 turns (see Fig. 2), of which any desired number could be included in the condenser circuit by means of a flexible lead and clip provided for that purpose, thus giving a maximum range of wave-length of from 300 to 1,350 ft. A 300 ft. aerial was used, which usually hung through a tube of Pertinax fitted in the deck of the fuselage.

Before flight the aerial wire was coiled on a special hand reel (weighing 5 lb.) provided with a leather brake band which clamped the reel at any required point in the wire. This aerial reel was not in use with the earlier types of Rouzet set.

The other side of the aerial circuit was connected at several points to the engine and other metal parts of the machine in order to form a good "earth" connection, or "balance" for the aerial. Inserted between these connections and the transmitter itself was a milliameter, or hot-wire radiation meter, for providing the operator with a visible indication of the amount of energy radiated and the consequent efficiency of his instruments.

When the first experiments were carried out with the original design of Rouzet transmitter an average range of 30 miles was frequently reported. At that time, however, the actual machines which carried out the tests were themselves in quite an early stage of experiment, and it is not difficult to realise that the extra weight of the wireless gear (particu-

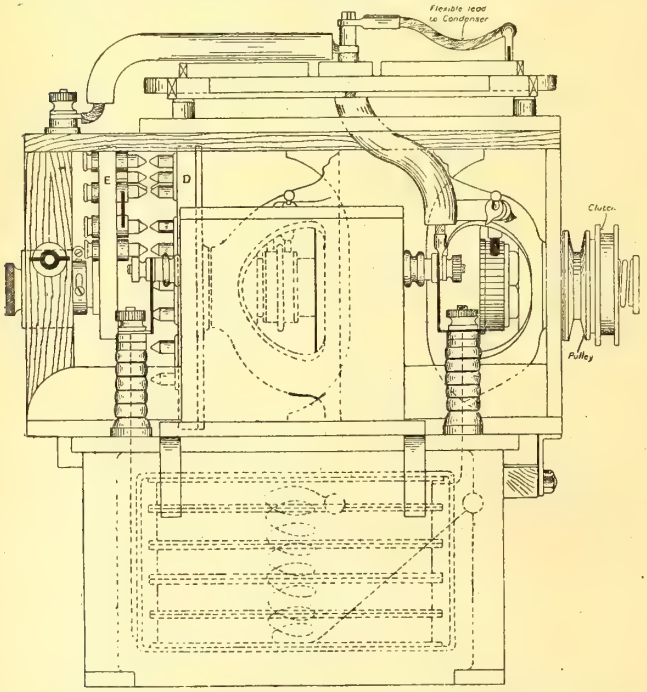

Fig. 1.—Side Elevation of the Rouzet Transmitter.

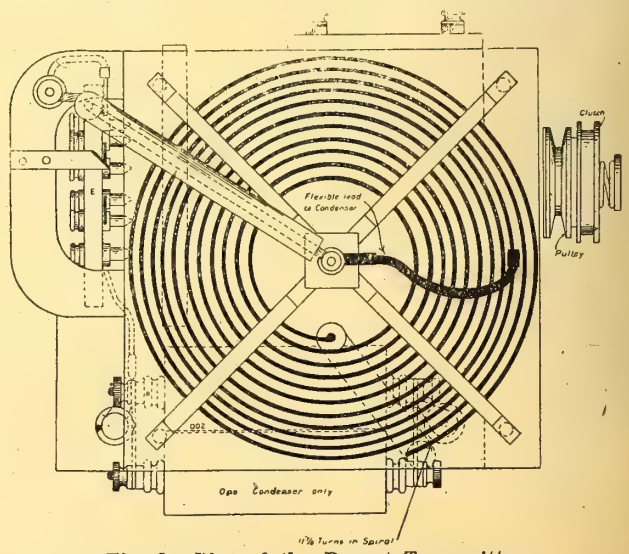

Fig. 2.—Plan of the Rouzet Transmitter.

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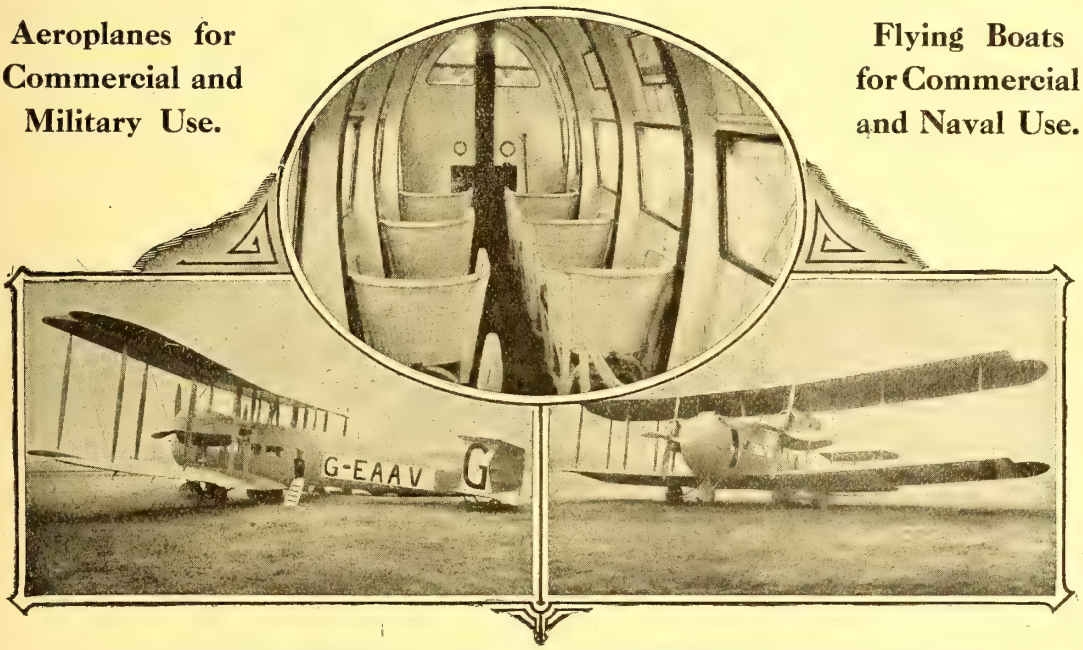

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larly in moments of danger) came to be regarded as a distinct encumbrance. Late in 1913 a number of naval seaplanes and airships were fitted with Rouzet sets and experiments carried out with different types of crystal receivers.

Crystal Receivers.

The function of the crystal receiver—and, indeed, of any receiver—is to "rectify" the incoming waves, which are of such exceedingly high frequency that they cannot possibly be detected by the human ear, even if they could be converted into sound waves, which is equally impossible. For this reason, the primary purpose of all wireless receivers is to break up the incoming waves into groups, which can then be utilised to actuate the diaphragm of the telephones to vibrate at an audible frequency.

It was found by experiment that certain types of crystals possessed the power of effecting this process of "rectification." This characteristic existed in these crystals with various degrees of sensitiveness, and long before attention was devoted to the problems of aircraft wireless, exhaustive experiments were carried out in search of the crystal most suited for this work. In addition to the varying sensitiveness that existed between different crystals, a further difficulty was incurred in the use of a crystal receiver for aircraft because of the great differences in sensitiveness that occurred at various points on the same crystal.

The delicacy of this form of receiver made it necessary to effect contact between the receiver circuit and the crystal by means of a light metal spring whih rested on the most sensitive point of the crystal—which could only be found by trial. This, of course, called for an efficient means of protecting the receiver from the vibrations of the engine, which made it exceedingly difficult to maintain the ideal point of contact.

Even with the most efficient crystal receiver, however, the signals received were never of sufficient strength to permit of reliable reception, and it became necessary to employ some mechanical method of augmenting the sound of the signals after they had been received. The first method by which this was accomplished will be discussed in the next article.

M. B. E.

SOME AUSTRIAN AIRCRAFT.

By ERIK HILDESHEIM.

W.K.F. AEROPLANES.

The W.K.F. Aircraft Mfg. Company, which has not previously been heard of in England, is both in its development and with regard to types produced typical of the conditions in the aircraft industry in the late Austro-Hungarian Empire, where lack of materials was the biggest obstacle to overcome during the greater part of the war.

The Vienna Body Works of Dr. Gutmann (the initials stand for Wiener Karosserie Fabrik) started building under licence the biplane designed by the Lloyd Works at Aszod, which was itself a Hungarian branch of the German D.F.W. Company.

The original 145-h.p. Austro-Daimler-engined Lloyd model was altered to take a 165-h.p. motor of the same make and built in series from December, 1915, as Type 43, for wireless and bomb-dropping work. When it became obsolete at the front it was used for a long time as a dual-control school machine owing to its great inherent stability.

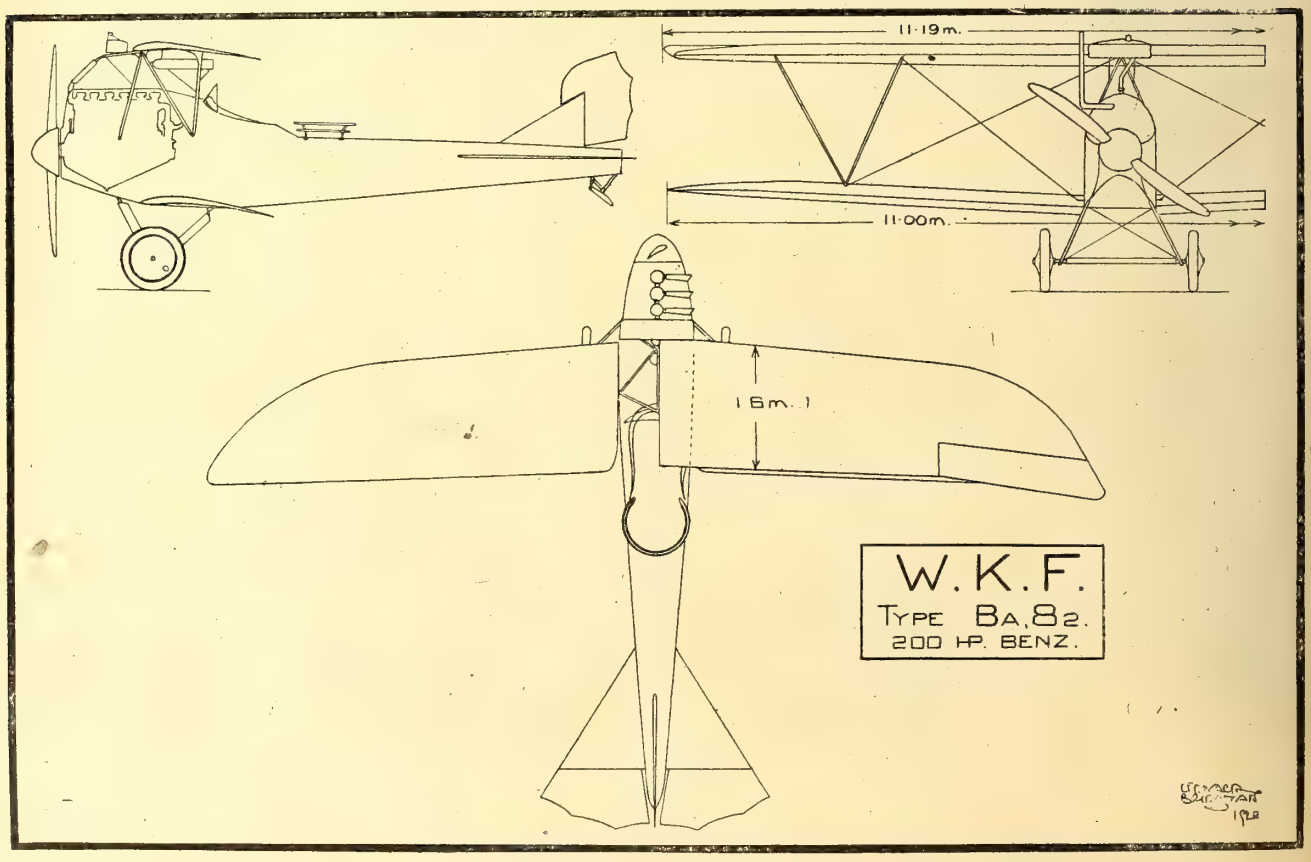
Type 44 was equipped with three-ply wings and body in order to save fabric, dope, wire, and turnbuckles. These wings were built on eight spars with numerous ribs and covered with three-ply. This wing practice was later given up in Austria, but taken up again in Germany, as in the last Fokker war product, the wireless parasol monoplane, B.VIII.

The performance of Type 44 included a speed of 137 km. per hour and a climb to 1,000 m. in 6 min. 12 sec.

The next W.K.F. type, the Ba.82, was originally designed in the autumn of 1916 for a 165-h.p. Austro-Daimler by Mr. Gasser, and the details were worked out by Lloyd. It was in the spring of 1917 remodelled by Mr. Schieferl, chief designer to the W.K.F. Company, to take a 220-h.p. Benz engine and then supplied in large numbers.

The W.K.F. Ba.82 tractor biplane shows the general characteristics of Austrian aircraft, viz., the high engine and cowl and the combined pilot and observer's cockpit. From the specification given below the performance will be seen to be a fair one for the time. With an airscrew designed specially for maximum speed over 200 km. per hour were attained.

Almost at the same time Type 81 was produced. This was an official type, designed by Professor Knoller, built under licence and forced upon the trade much with the same result as in other countries, as the design had to be altered so often during the experimental stage that it became out of date by the time it appeared at the front in quantity. The main features of the Knoller biplane were the twin Vee struts taking flying and landing loads with only incidence wiring, and the extraordinary far aft position for the observer's cockpit. Equipped with a 165-h.p. motor, the Knoller biplane



BEARDMORE

AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

attained a speed of 150 km. per hour and climbed to 1,000 m. in 45 min.

The Type 80.04 of autumn, 1917, was the first machine wholly designed by the W.K.F. Company and shows the features of the firm's products, viz., the oval fuselage with a Vee bottom, which allows an unbroken bottom plane and gives sufficient depth to take the 90 cm. focus camera.

The planes are again made of three-ply. Two pairs of inclined Vee struts are used with no wiring The upper Vee strut set runs to the top longitudinal of the fuselage; the other set is attached to the front set of the three Vees of the landing gear.

This interplane strut arrangement was later abandoned in Austria, but is found again on the Albatros D.XI, 1918 type. The main difficulty lies in the double function and change from landing to flying loads.

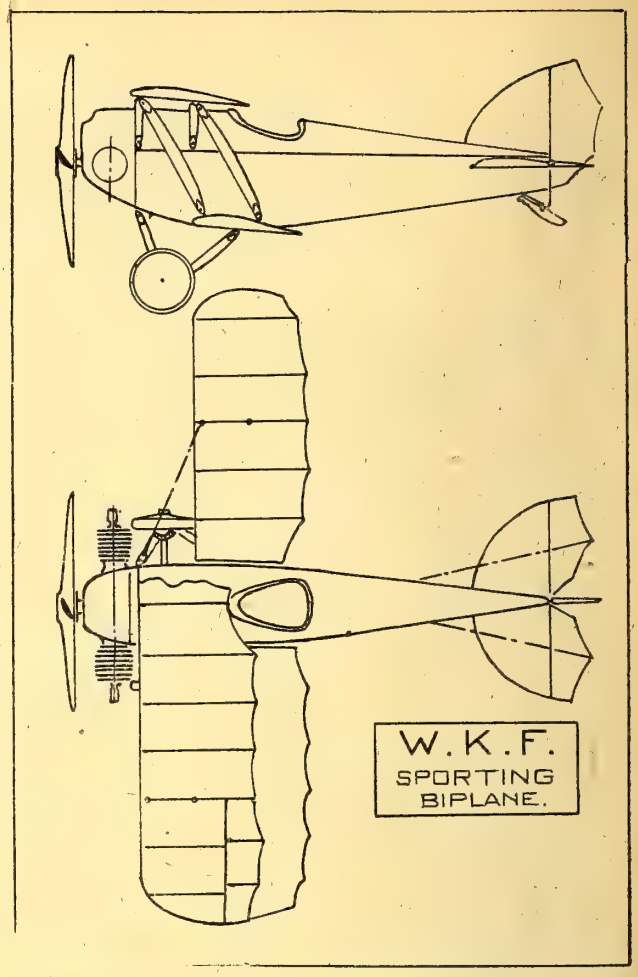
The angle of incidence of the ailerons decreases towards the tips. The W.K.F. 80.07 model, powered by a 230-h.p. Hiero motor, showed the best performance at the last Austrian competition at Aspern for two-seaters.

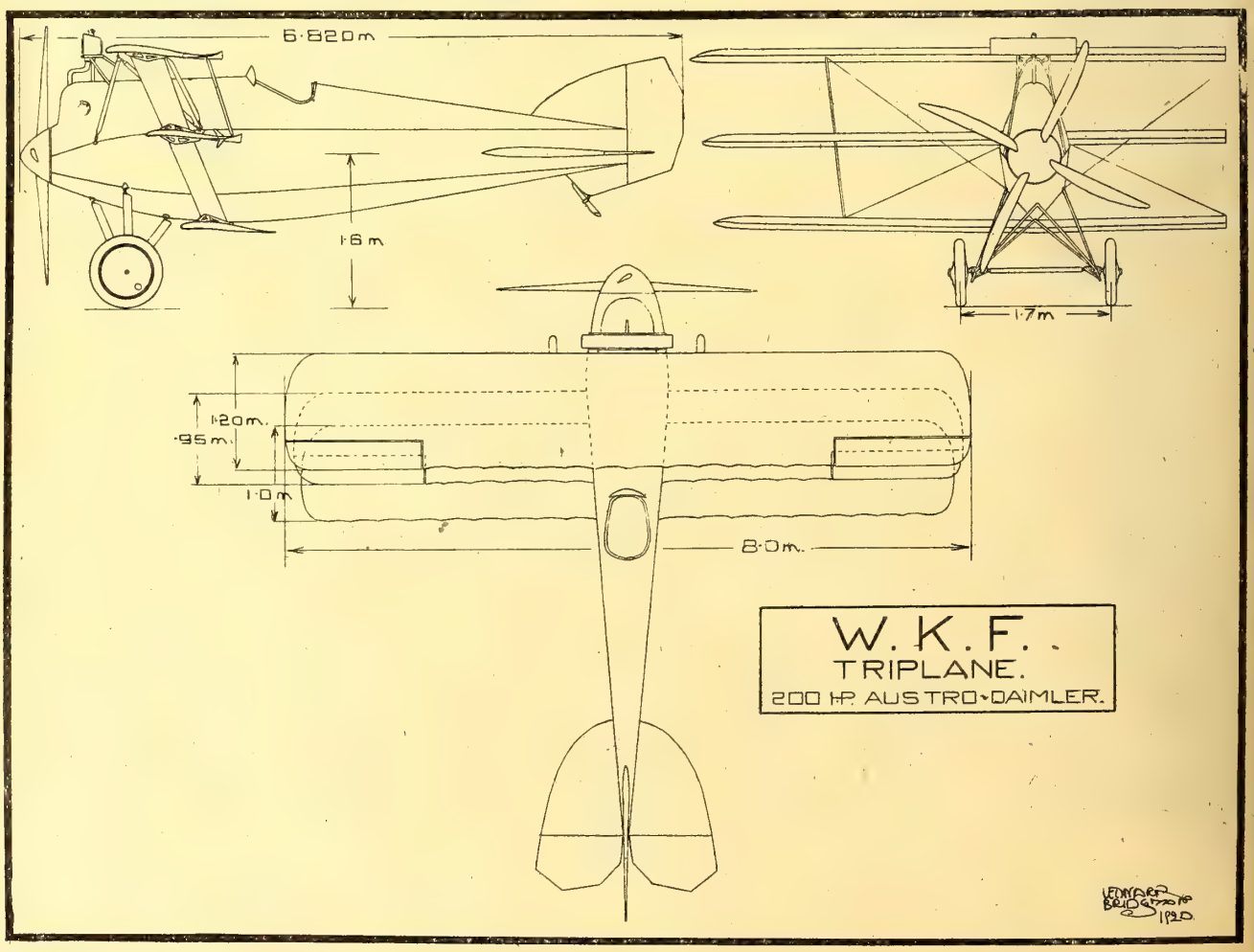
One set of interplane struts and two landing and flying wires are provided, the latter acting also as drift and anti-drift wires.

The triplane idea was adopted for a W.K.F. scout, where rather good vision for this type was attained, as the gap could, thanks to the deep fuselage, be kept large. Both the top and centre planes were equipped with ailerons. The fuel consumption of the 200-h.p. engine being 225 grams per h.p.-hour, the flight duration works out at 1½ hr. No gravity tank is provided.

On the day after the Austrian collapse the general design for the 35-h.p. W.K.F. sporting model had been worked out. This is a biplane fitted either with wheels or floats. It is to be fitted ultimately, it is believed, with the new 40-h.p. Hiero engine. (As, so far, Hiero aero-engines have shown up well the civil model should stand a good chance of gaining a market, particularly when the present exchange rate is considered.) For the test flights this spring only a German three-cylinder air-cooled Hacke motor of 35 h.p. was available.

The fuselage is made of three-ply and weighs 17 kilos. An auxiliary oil-tank is provided above the engine, as the latter does not hold enough oil for 10 hours, which is the proposed flying endurance. The main petrol-tank has a capacity of 95 litres; the auxiliary one holds 10 litres.





ROLLS-ROYCE

THE 1920 MODEL.

The BADMINTON MAGAZINE for July, 1920, gives its opinion of "THE 1920 ROLLS-ROYCE ON THE ROAD."

. . . speed, acceleration and absence of noise are the predominating features . . . . . as they are realised in the 1920 Rolls-Royce they make for the most luxurious travel I have yet experienced.

In the matter of acceleration the new Rolls-Royce is wonderful.

The entire absence of noise is one of its most remarkable features . . . . the Rolls-Royce is a motor carriage, and the producers of the 1920 model have shown that noise is out of place on a carriage, and that such a car is possible and better without it.

. . . . a very remarkable advance over even the best of their pre-war models.

"BADMINTON MAGAZINE"——————————July, 1920.

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Leicestershire, Derbyshire, Notts., Lincs., Staffs., Worcestershire, Warwickshire, Northants. and Rutlandshire: The Midland Counties Motor Garage Co., Ltd., Granby Street, Leicester. Manchester and District, including East Lancs. (as far north as a line drawn on the map due east from Cockerham) and East Cheshire: Joseph Cockshoot & Co, Ltd., New Bridge Street, Manchester.

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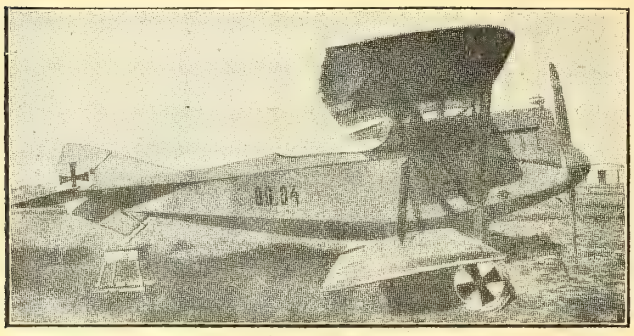
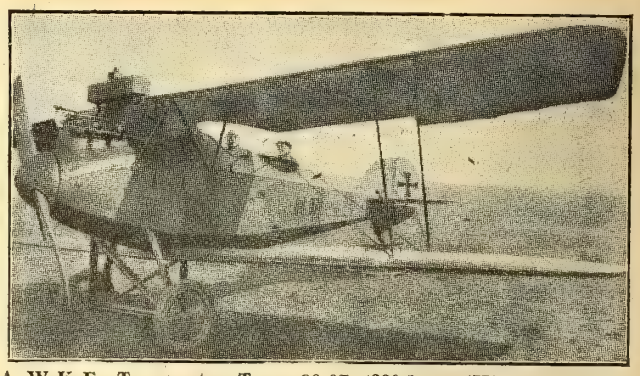
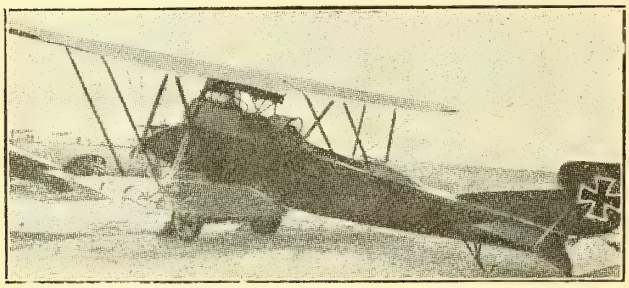


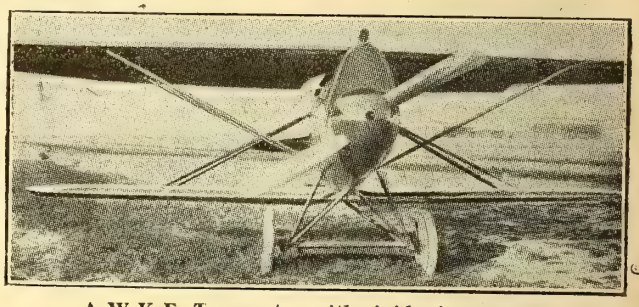
The W.K.F. Two-seater Type 80.04 (200-h.p. A.D. engine).



A W.K.F. Two-seater Type 80.07 (230-h.p. "Hiero" engine).



The "Knoller" Two-seater, an Austrian official design (165-h.p. Austro-Daimler).

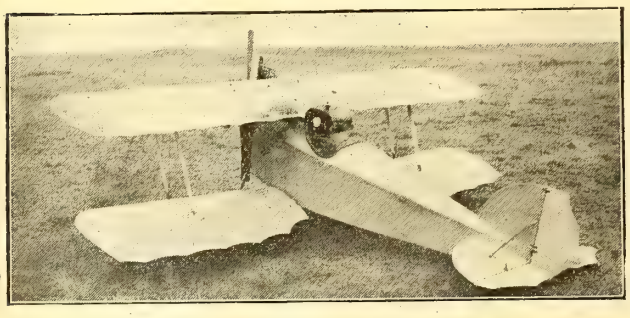


A W.K.F. Two-seater with rigid wing truss.

Engine .....220-h.p. Benz	Weight loaded.....1,214 kg.
Airscrew .....2.65 dia. 2.35 p.	Fuel capacity .....2 hr.
Weight empty .....860 kg.	

Type ...Single-seater (triplane)	Chord (bottom) 1.0
Purpose .....Fighter	Total wing area (sq. m.), 22.49
Span (metres) 8	Engine ... 200-h.p. Austro-Daimler
Length overall (metres)...6.82	Airscrew .....2.7 dia.
Chord (top) 1.2	Weight loaded.....935 kg.
Chord (middle) 0.95	Fuel capacity .....1.5 hr.

Type .....Single-seater	Chord (bottom) 1.0
Purpose .....Sporting	Engine ..... 35-h.p. Hacke
Span (metres) 5.4	Weight loaded .....330 kg.
Length overall (metres) ...4.1	Fuel capacity, 10 hr., 1,300 km
Chord (top) 1.0	



The W.K.F. 35-h.p. Sporting Model.

The top plane is in one piece and the front spar is the leading edge. The landing gear is made of three-ply and solid wooden wheels with metal bushes for the nutwood hubs are used, without tyres so far. The flat oak-clad rims of 710 by 100 mm. were extensively employed for school flying by the former Imperial Flight Arsenal.

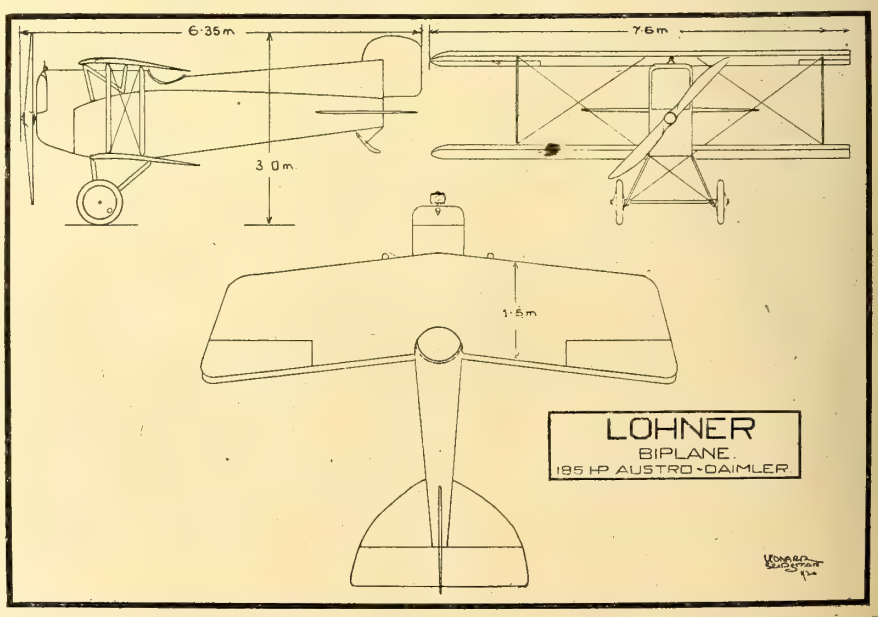
SPECIFICATIONS OF THE W.K.F. AEROPLANES.

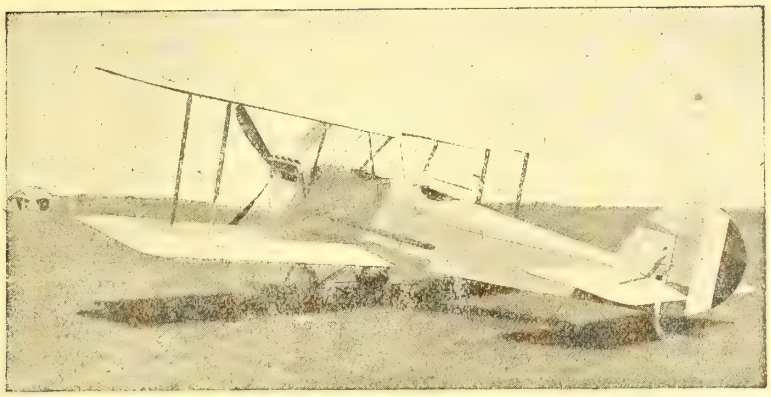
No.	43
Type	Two-seater
Purpose	Bombing, etc.
Span (metres)	14
Length overall (metres)	9
Total wing area (sq. m.)	38
Engine	165-h.p. Austro-Daimler
Weight empty	925 kg.
Weight loaded	1,330 kg.
Fuel capacity	6 hr. 550 km.
Speed	134 k.p.h.
Climb to 1,000 m.	6 min. 14 sec.
Ceiling	3,500

No.	Ba82
Type	Two-seater
Purpose	Reconnaissance
Span (metres)	11.19
Gap (metres)	1.85
Chord (top)	1.6
Chord (bottom)	1.6
Dihedral angle	5 deg.
Total wing area (sq. m.)	27.12
Elevator area (sq. m.)	1.3
Fin area (sq. m.)	0.53
Area of tail plane (sq. m.)	1.6

LOHNER LAND MACHINES.

As Etrich had already given up the manufacture of his "Taube" line at the outbreak of war, Lohner remained the only Austrian manufacturer of international note. His flying boats and the enemy copy of them have already been described in the article on Lower Adriatic, which was an ideal smooth water field for the type. After the war commercial Lohner flying boats have been employed for mail service in the Ukraine, and have, in converted editions, been sold for joy-





THE BOULTON & PAUL—P. 9.

An Aeroplane which is a Sound Commercial and Private Proposition

In this P. 9 Machine we have, we feel, solved the problem of providing an Aeroplane which is a sound business proposition—and which combines with low cost the great essentials for Commercial and Private use. All our great resources of material and craftsmanship have been utilised. Scientific Research and Experiment by a staff associated with flying from its beginnings coupled with the great Experience gained through the building of thousands of Aeroplanes during the War, have been concentrated in the production of this P. 9 Model.

It is a Two-Seater—Single Engine Tractor—which has attained on test a speed of over 100 miles per hour.

Its outstanding features are :—

CHEAP AND EASILY HOUSED. The Initial cost is extremely low ——— and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size it is easy to handle on the ground and requires but little accommodation. The principal dimensions are: Span, 27 ft. 6 in.; Length, 25 ft.; Height, 10 ft.

EASY TO FLY. The P. 9 has a big speed range, and low landing speeds, and this combined with Stability at all trimming speeds and well-balanced controls, allows the machine to be flown for long periods without undue fatigue. It also gives the maximum of Safety possible.

COMFORT AND CONVENIENCE. The comfort of the Pilot and Passenger has been specially considered. Each Cockpit is roomy and fitted with our special Seats. Controls for both Flying and Engine are fitted in the fron and rear Cockpits to enable the machine to be flown from either position. The exhaust from engine is discharged behind the rear Cockpit giving a silencing effect and freedom from fumes. Two standard cases are provided for luggage and form part of the fairing immediately behind the rear Cockpit.

The uses to which this compact and efficient machine can be put are wide and various, and will suggest themselves to those who have been awaiting the stage of Aeronautical Development now reached by the P. 9. It can be used for dozens of Commercial Purposes. The same type carried photos from R. 34 direct to London. It has been sent to Australia for Sheep-runs—and will soon be in use in various parts of the world for Exploring Uncharted Territory, Examining Timber Tracts, Fighting Forest Fires, Carrying Mails to Distant Mines, Transition of Colonial Mails to Mail Steamers, and for General Patrolling and Police Purposes.

If you are interested—write for full particulars. State your needs or purpose, and our engineers will consider every detail closely—to advise soundly.

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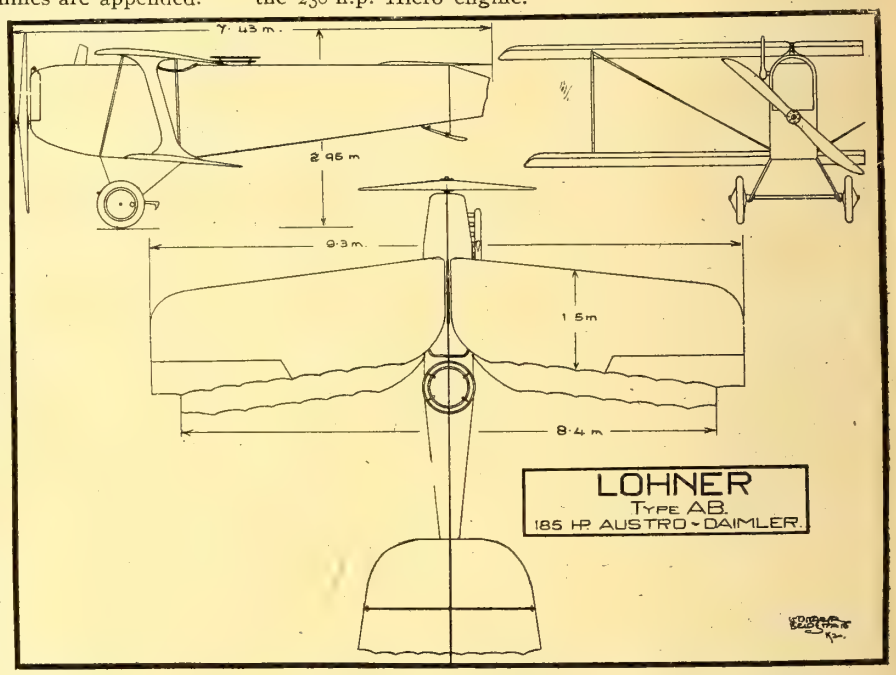
riding purposes to Switzerland and elsewhere, the low, Austrian exchange rate affording a strong inducement.

Lohner's land-going aircraft activities during the war included the development of his own types and also sub-contract work on the Knoller and Berg scout types, of which the former was an official design and a complete washout. Illustrated here are the latest Lohner war products, a single and a two-seater fighter respectively. The distinct feature of both is the high fuselage specially favoured in Austria; the two-seater biplane is fitted with a four-bladed airscrew and with single interplane struts of T section.

The dimensions and data of these machines are appended.

Specifications of Lohner Aeroplanes.

Type	Two-seater A.B.
Overall length	7.43 m.
Overall height	2.95 m.
Span (top)	9.3 m.
Span (bottom)	8.4 m.
Chord	1.6 m.
Surface main planes	30 sq. m.
Surface ailerons	2 sq. m.
Surface rudder	0.5 sq. m.
Surface elevator	2 sq. m.
Engine	185-h.p. Austro-Daimler
Speed	178 k.p.h.
Range	370 km.
Climb to 1,000 m.	3 min. 40 sec.
Petrol, duration	2 hrs.
Petrol, quantity	85 kg.
Oil	20 kg.
Useful load	190 kg.
Weight empty	750 kg.
Weight of radiator water	35 kg.



Type	Scout A.A.
Overall length	6.35 m.
Overall height	3 m.
Span	7.6 m.
Chord	1.5 m.
Surface main planes	20 sq. m.
Surface ailerons	1.3 sq. m.
Surface rudder	0.66 sq. m.
Surface elevator	1.4 sq. m.
Engine	185 h.p. Austro-Daimler
Speed	193 k.p.h.
Range	386 km.
Climb to 1,000 m.	2 m. 40 s.
Petrol, duration	2 hrs
Petrol, quantity	94 kg.
Oil	23 kg.
Useful load	130 kg.
Weight, empty	623 kg.
Weight of radiator water	19.5 kg.

THE PHONIX FLUGZEUGWERKE, WIEN-STADLAU.

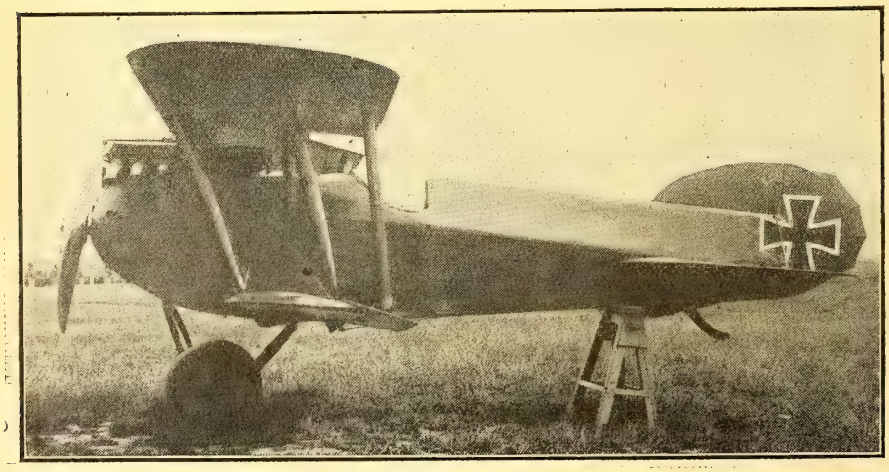
As the quantity production plant to the Oesterreichisch-Ungarische Albatros Flugzeugwerke the Phönix works turned out during the war altogether 1,084 aeroplanes of 22 different models, starting with the 140-h.p. Hiero or 160-h.p. Mercédès-engined Albatros two-seater, passing next to Brandenburg types, and ending with the Phönix models of their own design, which have since the Armistice been introduced into Scandinavia by the flights of the chief designer Sparrmann, Captain Perini, and the Arctic explorer Dr. König, in flights from Vienna over Berlin to Copenhagen, Stockholm, and Christiania.

The Phönix type 3 was developed in 1915 and 1916 from the Brandenburg C.1, and was in favour from January, 1916, to July, 1918, in which period 344 were supplied to the Austrian forces. The fuselage of square section was planked with plywood and the ailerons were of Zanonia shape. The 160 or 180-h.p. Austro-Daimler-engined Phönix model 5 was the Austrian edition of the Brandenburg scout with X struts taking landing and flying stresses, and developed into the 20.14 design with the fuselage filling the gap and a strut arrangement, found also in one of the latest Albatros scouts (D.XI.), viz., a Nieuport type V interplane set of struts, one strut running from the fuselage top longeron to the base of the interplane V taking both landing and flying loads. Next came the characteristic Phönix biplane, type 6 of 1917, equipped first with the 180 h.p. Austro-Daimler, later with the 230-h.p. Hiero engine.

From this two-seater the similar single-seater scout models 8 and 9 were developed. Known as 20.24 and 20.25, the former model was powered by a 230-h.p. Hiero, the latter also by the super-compressed 250-h.p. Austro-Daimler engine. A change in the body form is the V-bottomed oval section. The tail plane is built in one with the fuselage, and the non-balanced rudder is attached to the tapered end. The rear struts of the undercarriage are fixed to the front spar of the one-piece lower plane.

A further 1917 production was a G class biplane with two 200-h.p. Hiero engines, mounted over the rear spars for reasons of balance, and driving oppositely revolving tractor screws on extended shafts, somewhat as in an experimental Schütte-Lanz aircraft. Car-type radiators are mounted directly in front of each engine. The seating accommodation for three follows the usual German arrangement. The square-sectioned fuselage is cut down abreast of the screws and is raised above the lower planes. Two balanced rudders are attached to the fins in the slip stream and are supported inside to the body. Three sets of struts are provided; the planes are swept back; the bottom ones are also set at a dihedral.

The raised fuselage occurs again in the 1918 Phönix type 10, modelled on the Brandenburg biplane. It is equipped with a 230-h.p. Hiero engine and one-piece planes, and was known as the 20.19 edition.



THE PHONIX "9" SINGLE-SEATER.—This machine was fitted with the 250-h.p. Austro Daimler of super-compressed high-altitude type. The great depth of the fuselage should be noted, this being characteristic of Austrian war designs and is attributed to the opinions of the Chief of the Austrian Air Service.

Beardmore

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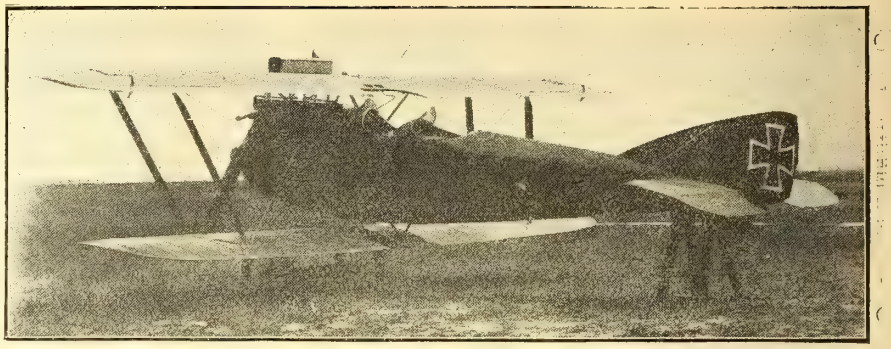
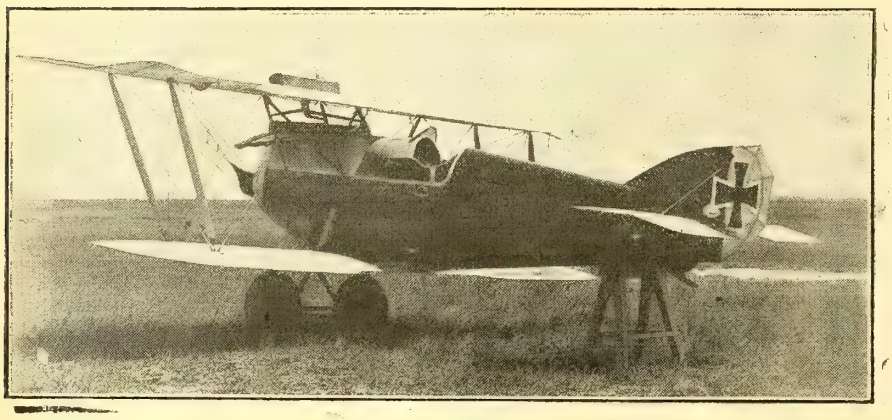
AeroEngines

THE PHONIX "10"—a 1918 two-seater fitted with a Hiero engine of 230 h.p. The raising of the fuselage between the planes—after the Bristol fighter style—is notable, also the use of a lower plane of reduced span and raking interplane struts. Also it may be remarked that although a two-seater it is a single-bay machine.



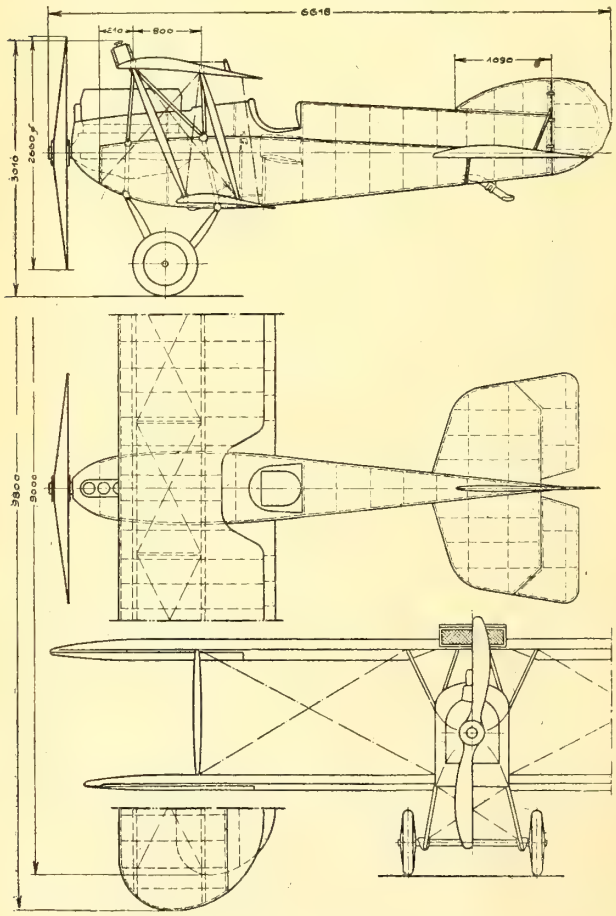


THE PHONIX "12"—a very late single-seater, strongly resembling the "10" type two-seater above. In this photograph the "wash-out" of the aileron tips is very noticeable. The radiator position—above the centre section—shows that the Austrians followed their Allies in this respect.

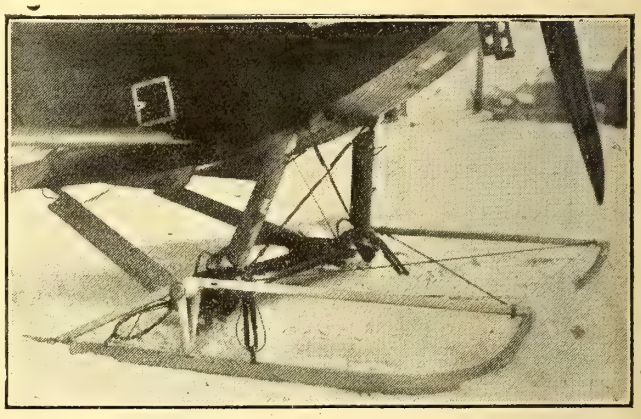
The Phönix model 13 follows closely the former Phönix two-seater, except for a combined pilot and observer cockpit in the former and that wood is mainly employed, for instance, for interplane struts, owing to lack of steel, as in Germany.

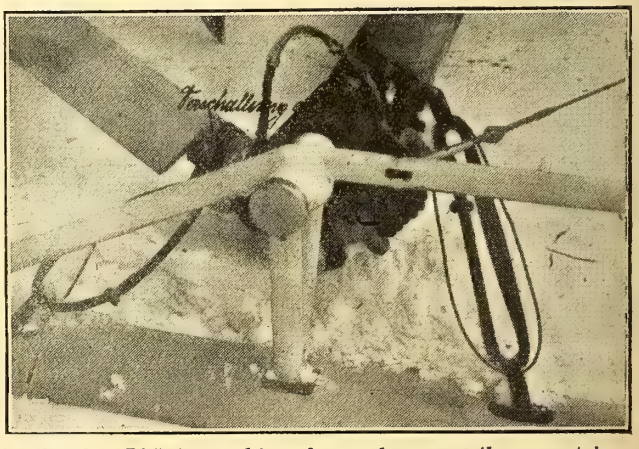
It is not uninteresting to note that working among the mountains on the Italian frontier, Austrian aircraft were often compelled to use snow-covered aerodromes, and for this purpose many were fitted with skis in place of wheels.

The two illustrations attached show skis fitted to Phönix machines, and it is noteworthy that they bear a very close resemblance in every way to those used recently on the F.O. Flygkompani's Avros and Faireys in Northern Sweden. Like these latter the Austrian skis are apparently interchangeable with the normal wheels, and the check wires and shock absorbers arranged to hold the nose of the skis up to ensure landing on the heel are embodied in the design.



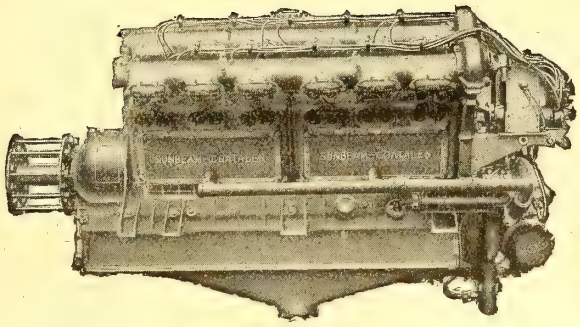
Outline drawings of the Phönix "9."





Skis fitted to Phönix machines for work among the mountains in winter. At the top undercarriage complete. Below details of the springing and check rubbers.

SUNBEAM-COATALEN AIRCRAFT ENGINES

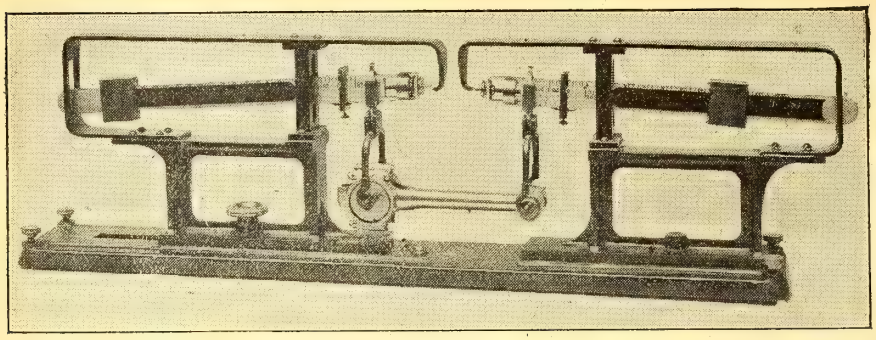


These engines of which an example, the "Manitou" of 300 h.p., is here depicted, have won a wide and enviable reputation for

EFFICIENCY AND RELIABILITY

The Company were pioneers in aviation engine production long prior to the war, and their wealth of designing and manufacturing experience ensures the uniform excellence of their productions.

The Sunbeam Motor Car Co., Ltd., Moorfield Works, Wolverhampton.



FROM THE A.I.D. EXHIBIT AT OLYMPIA.—A connecting-rod weighing and balancing machine. It will be seen that it weighs the rods from both ends, and thus determines the total weight and checks the correct balance from the distribution of the load between the two ends.

TRADE NOTES.

Airship Activities.

Mr. E. R. Preston, who has for many years been associated with the Goodyear Tyre and Rubber Co., Ltd., at Akron, Ohio, has recently been appointed Managing Director to the Goodyear Tyre and Rubber Company (Great Britain), Ltd. Mr. Preston came to England some few months ago on a visit of inspection under the impression that he was to return to America very shortly, but it has now been decided, owing to recent developments, that he should remain permanently as Managing Director of the firm in this country. All those who have had the pleasure of meeting Mr. Preston will be greatly gratified.

Mr. Sydney Oxon, who has for some time been Acting Sales Manager, has now been appointed definitely as Sales Manager and has become a member of the Board of Directors.

The Goodyear Company has done excellent work in the development of small airships in the United States, and it is understood that although at the present moment the firm's business in this country is concerned with ordinary tyre and rubber business, it is by no means outside the bounds of possibility that it may take an active part in the Aircraft Industry. This is all the more likely in view of the fact that Mr. Preston, the new Managing Director, is a keen balloonist.

It will be remembered by the older hands connected with ballooning that Mr. Preston's brother and Mr. Upson, both of the Goodyear Tyre and Rubber Company, made a record balloon journey in the course of the Gordon-Bennett Balloon Race in America before the war.

The Goodyear Company during the war provided the United States Army and Navy with some of its best small airships, and, as already recorded in this paper, the firm has recently embarked still further in the airship business, having acquired a very large airship (320,000 cubic feet) of French design and having produced a number of small airships more or less of the "Blimp" type, for sporting use. The big airship mentioned has an envelope 260 feet long and a cabin 47 feet long. The twin engines are 250 h.p. each. It is proposed to use this ship on a 150-mile air line between Akron and Detroit, the capacity of the ship being about thirty passengers.

An airship station has been established at Wingfoot Lake, near Akron, which will be the head of the Goodyear Aeronautical Department. It is intended to use a mooring station at Detroit instead of a shed. The Blimp type of airship built by the Goodyear Company is known as the "Pony," on account of its small size. It has seating capacity for a pilot and one passenger and it has a speed of 40 miles an hour with about ten hours' petrol. Its length is 95 feet, and its height about 40 feet.

It is to be hoped that the enterprise which the Goodyear Company are showing in America will extend to their British Company, for undoubtedly there is quite good business to be done in Europe with small airships, if only somebody had the pluck and intelligence to develop them. In fact, one believes that joy-riding in small airships would be considerably more profitable than joy-riding in aeroplanes if it were organised on a proper basis. At any rate, we may rest assured that Mr. Preston and Mr. Oxon will not lose any opportunities which offer themselves of helping the progress of aviation.

Wireless.

A wireless telephone is now fitted to the Instone air liner "City of London." By its aid Mr. Samuel Instone recently gave verbal orders to the machine on the way to Paris. He spoke from his London office through the ordinary telephone as far as Croydon and was then put through to the wireless hut, where he was switched through to the "Vimy" when it was over Lympne.

The wireless telephone on the "Vimy" was supplied by the Marconi Wireless Telephone Company, Strand, London, who also supply all the tackle in the wireless hut at Croydon. An instrument is also to be installed by them in the offices of the Instone Air Line at Croydon.

The company also have a D.H.6 at the London Terminal Aerodrome, with which they carry out wireless air tests.—G. D.

An Extension of Business.

That interesting publication *La Vie Technique et Industrielle* has, owing to its recent extensive developments, been registered as a limited company under the title of *La Vie Technique et Industrielle et Publications Plumon*. The new firm is a Société Anonyme with a capital of 1,000,000 francs. The head office is at 18, rue Seguier, Paris VIe, as before.

La Vie Technique reviews each month the leading trade and technical publications of the world and is certainly most valuable to any firm which wishes to keep in touch with industrial developments in all industries.

In Another Sphere.

"The Horse, as Comrade and Friend," is the title of a new book to be published shortly by Messrs. Hutchinson and Co. The author is Mr. Everard R. Calthrop, who is a well-known authority on horses, in addition to being the inventor of the famous "Guardian Angel" parachute. An introductory letter by Lord Lonsdale commends the book to all who are interested in the training of horses.

Mr. Calthrop describes in detail his system of breaking-in wild horses, and his pages are full of sound information and advice which will be appreciated by both professionals and amateurs. The book is delightfully written and handsomely illustrated, and lovers of horses should make a note of this forthcoming publication.

History Repeats Itself.

It is interesting to note that the Martinsyde "Semiquaver" which won the Aerial Derby on Saturday, July 24th, was doped with Cellon.

Added interest is given to the fact because the machine which won the first Aerial Derby in 1912—namely, Mr. Sopwith's "Blériot"—was also doped with Cellon.

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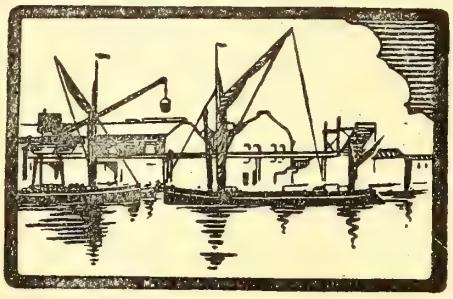

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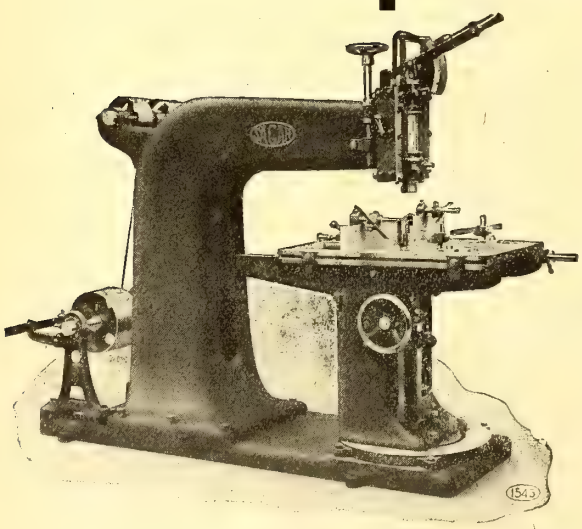

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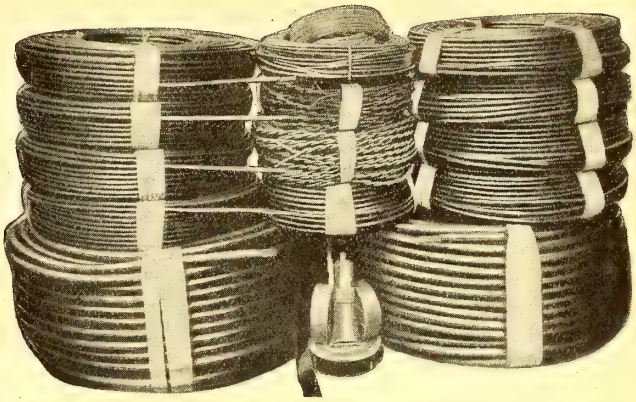

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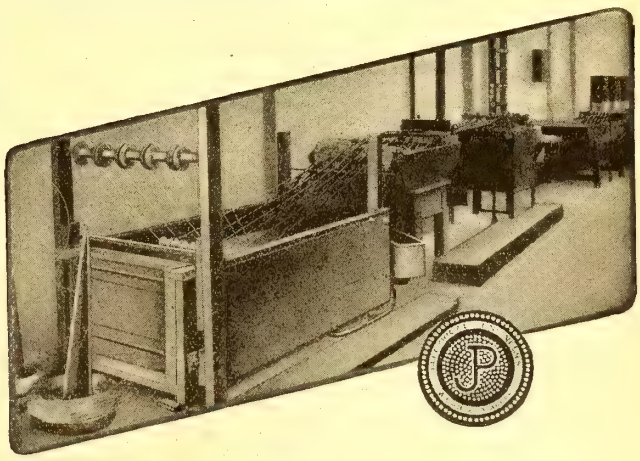

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

NOTICE TO AIRMEN (No. 89).
LIZARD WIRELESS DIRECTION FINDING STATION.

AIR MINISTRY, Aug. 24th.

It is hereby notified:—

The Lizard Wireless Direction Finding Station ceased to be in operation from midnight (G.M.T.), Aug. 22nd-23rd, and will not function until further notice. The position of this station is lat. 49 degs. 59 mins 7 secs. N., long. 5 degs. 12 mins. 18 secs. W.

Authority.—The Lords Commissioners of the Admiralty (Notice to Mariners 1300 of 1920).

NOTICE TO AIRMEN (No. 90).
CLOUD AND VISIBILITY SIGNALS AT LYMPNE AERODROME.

AIR MINISTRY. Aug. 24th.

It is hereby notified:—

A system of ground signals has been established at Lympne Aerodrome to denote to pilots the height of clouds above and visibility at Biggin Hill and Croydon Aerodromes

The Stations will be denoted by letters:—

B. representing Biggin Hill, and
C. representing Croydon.

The height of clouds and visibility will be indicated by numerals. All signals are *White*.

Height of clouds will be denoted by the following numerals:—

1 = 0 to 200 ft.
2 = From 200 to 500 ft.
3 = Over 500 ft.

These signals represent the height of clouds *above the respective Aerodromes and not above sea level.*

Visibility will be shown in a similar way, viz.:—

1 = Below 500 yds.
2 = 500 to 1,000 yds.
3 = Over 1,000 yds

The signals are always displayed in the following order:—

(1) Station.
(2) Height of clouds.
(3) Visibility.

e.g., B. 1. 2.; or C. 2 3.

The signals are situated approximately 30 yds. east of the Office of the Civil Aviation Traffic Officer, and 140 yds. west of the Compass Base. They are so placed as to be read the right way up when flying in a north-westerly direction.

NOTICE TO AIRMEN (No. 91).
DANGER ZONE ON FRENCH COAST.

AIR MINISTRY. Aug. 27th.

It is hereby notified:—

Pilots flying between London and Paris and over Northern France are warned that the burning of cordite is taking place at Dannes, 5 miles north of Etaples, France (lat. 50 degs. 36 mins. 0 secs. N., long. 1 deg. 37 mins. 0 secs. E.).

Owing to the resultant air pockets set up aircraft should avoid the neighbourhood.

A further notice will be issued when the operations have ceased.

CONTINENTAL ARRIVALS AND DEPARTURES.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.)

[*The following table of arrivals at and departures from the British Air Ports is compiled on the following system:— First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot.*]

AUGUST 23rd:

A.T.&T., DH9, G-EAOZ, London-Paris, 09.38-11.45, G.&M., Nil, Robbins.
A.T.&T., DH9, G-EAPU, London-Amsterdam, 09.38-12.42, G., Nil, Milnes
I.A.L., DH4, G-EAMU, London-Brussels, 10.45—, Nil, 2, Barnard.
I.A.L., Vimy, G-EASI, London-Paris, 12.40-15.35, Nil, 5, Chattaway.
A.T.&T., DH16, G-EASW, London-Paris, 17.30-19.41, G.&M., 4, Armstrong.
A.T.&T., DH18, G-EAUF, Paris-London, 10.40-13.36, G., 4, Powell.
C.T., Nieuport, F-CGTE, Paris-London, 12.35-15.25, M., Nil, Lasnes.
C.desG.E.A., Goliath, F-GEAC., Paris-London, 12.45-15.53, G., 5, Labouchere.
A.T.&T., DH9, G-EAGY, Paris-London, 16.35-19.00, G., 2, Carter.
A.T.&T., DH9, G-EAQN, Amsterdam-London, 16.20-19.00, M., 3, Bamber.
A.T.&T., DH16, G-EALM, Paris-London, 16.40-19.00, Nil, 3, Tebbitt.
H.P.T., HP, G-EATN, Paris-London, 17.15-20.40, Nil, 3, Olley.

AUGUST 24th:

A.T.&T., DH9, G-EAQN, London-Amsterdam, 11.28-14.40, G., Nil, Forson
A.T.&T., DH16, G-EAPT, London-Paris, 11.30-13.45, G.&M., 3, Lines.
C.desG.E.A., Goliath, F-GEAC, London-Paris, 13.05-15.30, G., 6, Labouchere.
C.T., Nieuport, F-CGTE, London-Paris, 13.43-17.10, Nil, Nil, Lasnes.
A.T.&T., DH9, G-EAOZ, London-Paris, 16.45-18.50, M., 2, Tebbitt.
A.T.&T., DH9, G-EAOZ, Paris-London, 09.55-12.25, Nil, 2, Robbins.
M.A., Brequet, F-CMAB, Paris-London, 12.40-15.30, G.&M., Nil, Le-Men.
A.T.&T., DH16, G-EASW, Paris-London, 14.00-16.32, G., Nil, Armstrong.
A.T.&T., DH9, G-EAPU, Amsterdam-London, 15.10-17.38, M., 2, Milnes.
S.N.E.T.A., DH4, O14, Brussels-London, —15.30, Nil, 1, Simonet.
I.A.L., Vimy, G-EASI, Paris-London, 17.15-20.10, Nil, Nil, Chattaway.
A.T.&T., DH16, G-EAPT, Paris-London, 17.15-19.58, Nil, 4, Lines.

AUGUST 25th:

A.T.&T., DH16, G-EASW, London-Paris, 10.07-12.35, G.&M., 3, Powell.
A.T.&T., DH9, G-EAGY, London-Paris, 10.12-12.35, G., 2, Carter.
A.T.&T., DH9, G-EAQL, London-Amsterdam, 10.35-13.45, G., Nil, Robbins.
M.A., Brequet, F-CMAB, London-Paris, 13.50-16.50, Nil, Nil, Le-Men.
A.T.&T., DH9, G-EAPU, London-Paris, 17.15-19.40, G.&M., 2, Milnes.
A.T.&T., DH9, G-EAOZ, Paris-London, 09.45-14-15, Nil, 2, Tebbitt.
C.desG.E.A., Goliath, F-GEAD, Paris-London, 12.10-19.10, G., 1, Favrant.
I.A.L., DH4, G-EAMU, Paris-London, 12.20-15.27, Nil, 2, Barnard.
A.T.&T., DH9, G-EAQN, Amsterdam-London, 15.57-18.20, M., Nil, Forson.
A.T.&T., DH16, G-EASW, Paris-London, 16.50-19.30, Nil, 4, Powell.
A.T.&T., DH9, G-EAGY, Paris-London, 16.50-19.30, Nil, 2, Carter.
Private, Caudron, F-ABEX, Le-Crotoy-London, —landed near Lympne, Nil, Nil, Mlle. Boland.

AUGUST 26th:

A.T.&T., DH18, G-EAUF, London-Paris, 09.38-11.55, G.&M., 5, Powell.
A.T.&T., DH16, G-EASW, London-Amsterdam, 10.35—, G., 1, Armstrong.
I.A.L., DH4, G-EAMU, London-Paris, 12.55-15.00, Nil, 2, Chattaway.
A.T.&T., DH16, G-EAPT, London-Paris, 16.35-19.00, M., 4, Reeves.
A.T.&T., DH9, G-EAPU, Paris-London, 11.00-13.40, G., Nil, Milnes.
A.T.&T., DH9, G-EAQL, Amsterdam-London, —17.55, G.&M., Nil, Robbins.
A.T.&T., DH18, G-EAUF, Paris-London, 16.40-19.00, G., 7, Powell.

AUGUST 27th:

A.T.&T., DH9, G-EAQN, London-Paris, 09.45-12.00, M., 2, Holmes.
A.T.&T., DH9, G-EAGY, London-Paris, 09.47-12.00, Nil, 2, Lines.
A.T.&T., DH9, G-EAPU, London-Paris, 10.07-12.25, G., Nil, Bamber.
A.T.&T., DH9, G-EAQL, London-Amsterdam, 10.28-13.33, G., Nil, Tebbitt.
C.desG.E.A., Goliath, F-GEAD, London-Paris, 10.50-14.40, G., 2, Favrant.
A.T.&T., DH18, G-EAUF, London-Paris, 16.53-19.00, G.&M., 6, Forson.
C.desG.E.A., Goliath, F-GEAC, Paris-London, 12.00-15.05, G., 2, Labouchere.
I.A.L., DH4, G-EAMU, Paris-London, 12.25-14.39, G.&M., 2, Chattaway.
A.T.&T., DH9, G-EAGY, Paris-London, 15.00-17.25, Nil, 2, Reeves.
A.T.&T., DH16, G-EASW, Amsterdam-London, 15.23-17.31, M., 1, Armstrong.
A.T.&T., DH9, G-EAQN, Paris-London, 16.10-18.35, Nil, 2, Holmes.
A.T.&T., DH9, G-EAPU, Paris-London, 16.30-19.20, Nil, 2, Lines.

AUGUST 28th:

A.T.&T., DH9, G-EAPU, London-Paris, 09.45-12.15, G.&M., 1, Robbins.
A.T.&T., DH9, G-EAPL, London-Paris, 09.50-12.15, Nil, 2, Milnes.
A.T.&T., DH16, G-EASW, London-Amsterdam, 10.15-14.20, G., 3, Reeves.
A.T.&T., DH9, G-EAGY, London-Amsterdam, 11.40-15.05, G., Nil, Holmes.
A.T.&T., DH18, G-EAUF, London-Paris, 16.50-18.50, G.&M., 4, Powell.
A.T.&T., DH18, G-EAUF, Paris-London, 10.00-12.25, G., 6, Forsen.
A.T.&T., DH9, G-EAQL, Amsterdam-London, 15.23-17.25, G.&M., Nil, Tebbitt.
A.T.&T., DH16, G-EASW, Amsterdam-London, 15.36-17.47, Nil, Nil, Reeves.
A.T.&T., DH9, G-EAPU, Paris-London, 16.30-19.16, Nil, 1, Robbins.
Private, Caudron, F-ABEX, Lympne-London, 17.35-18.44, Nil, Nil, Mlle Boland
Private, Caudron, F-ABDT, Lympne-London, 17.35-18.41, Nil, 1, Maicon.

AUGUST 29th:

A.T.&T., DH16, G-EASW, London-Paris, 10.24-12.30, Nil, 3, Armstrong
A.T.&T., DH9, G-EAQL, London-Paris, 11.55-14.20, Nil, 2, Lines.
C.desG.E.A., Goliath, F-GEAC, London-Paris, 13.01-—, Nil, 3, Labouchere.
A.T.&T., DH18, G-EAUF, Paris-London, 10.30-13.00, Nil, 7, Powell.
A.T.&T., DH9, G-EAPL, Paris-London, 10.30-13.01, Nil, 2, Bamber.

The Air Port of Cricklewood.

(Compiled from Log of Cricklewood Aerodrome. Times on the Continent from Air Ministry Communiques.)

AUGUST 23rd:

H.P.T., HP, G-EATN, London-Paris, 12.20-1530, Nil, 6, Olley & 1.
H.P.T., HP, G-EALX, London-Paris, 13.30-16.50, Nil, 4, Willcockson & 1
H.P.T., DH9, G-EAUN, London-Brussels, 14.51-18.20, G.&M., Nil, Hope.
H.P.T., DH9, G-EATA, London-Amsterdam, 16.15—, G.&M., Nil, Rogers.
H.P.T., DH9, G-EAUC, Brussels-London, —18.20, G.&M., 2 Moore.

AUGUST 24th:

H.P.T., HP, G-EATG, London-Paris, 12.10-15.10, G., 6, McIntosh & 1.
H.P.T., DH9, G-EATA, Amsterdam-London, —14.05, M., 1, Rogers.
H.P.T., HP, G-EASN, London-Brussels, 14.45-1750, G.&M., 2, Perry & 1.
H.P.T., HP, G-EALX, Paris-London, 12.20-16.15, Nil, 4, Willcockson & 1
H.P.T., DH9, G-EATA, London-Amsterdam, 16.25—, G.&M., 1 Fowler.

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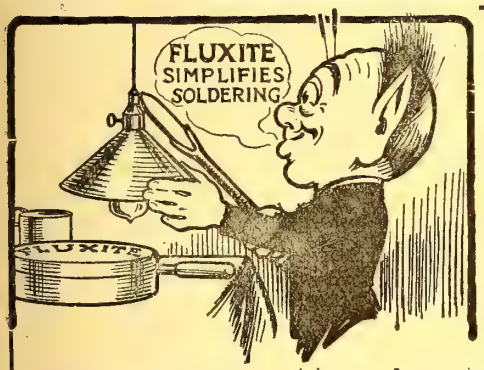

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Likewise

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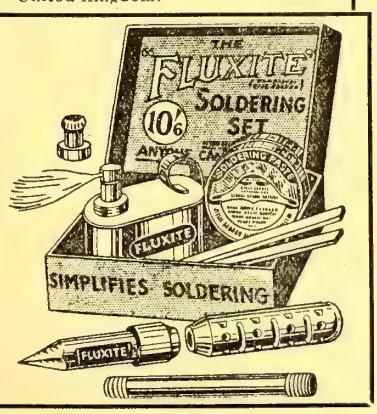

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VARNISHES, PAINTS & ENAMELS
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H.P.T., DH9, G-EAUN, Brussels-London, 15.00-17.35, G.&M., Nil, Hope.
S.N.E.T.A., DH4, O14, Brussels-London, —19.06, Nil, Nil, Simonet.

AUGUST 25th:

H.P.T., HP, G-EATL, London-Paris, 12.10-15.26, Nil, 8, Bager & 1.
H.P.T., HP, G-EASL, London-Paris, 12.25-16.10, G., 6, Beal & 1.
S.N.E.T.A., DH4, O14, London-Brussels, 12.25-17.30, Nil, Nil, Simonet.
H.P., DH4, O7, London-Brussels, 12.26-17.30, Nil, Nil, McNaught Davis
H.P., DH4, O17, London-Brussels, 12.20—, Nil, Nil, Olley.
H.P.T., DH9, G-EAUI, London-Brussels, 14.47—, G.&M., Nil, Capps.
H.P.T., DH9, G-EATA, Amsterdam-London, 11.40-14.30, G.&M., 1, Fowler
H.P.T., DH9, G-EAUN, London-Amsterdam, 16.10—, G.&M., 1, Moore.
H.P.T., HP, G-EASZ, Paris-London, 12.35-16.15, G., 1, Jones & 1.
H.P.T., HP, G-EASN, Brussels-London, 14.55-18.05, G.&M., 2, Perry & 1.

AUGUST 26th:

H.P.T., HP, G-EASY, London-Paris, 12.10-1545, G., 7, Willcockson & 1.
H.P.T., DH9, G-EAUN, Amsterdam-London, —14.15, M., 1, Moore.
H.P.T., H.P., G-EATL, Paris-London, 10.50-14.20, Nil, 4, Bager & 1.
H.P.T., DH9, G-EATA, London-Brussels, 14.50—, G.&M., 2, Hope.
H.P., DH4, O15, London-Brussels, 15.20—, Nil, Nil, Perry & 1.
M.A., Breguet, F-CMAV, Paris-London, 12.55-16.55, G.&M., Nil, Bourdon.
H.P.T., DH9, G-EAUN, London-Amsterdam, 16.15—, G.&M., Nil, Rogers.
H.P.T., HP, G-EASL, Paris-London, 12.30-16.10, G., 4, Beal & 1.
H.P.T., DH9, G-EAUI, Brussels-London, —17.25, G.&M., Nil, Capps.
S.N.E.T.A., Farman, O-BLAN, Brussels-London, —18.25, Nil, 11, George & 1.

AUGUST 27th:

H.P.T., DH9, G-EAUQ, London-Calais, 10.30—, Nil, 2, Fowler.
S.N.E.T.A., Farman, O-BLAN, London-Brussels, 11.10-14.55, Nil, Nil, George.
M.A., Breguet, F-CMAY, London-Paris, 12.40—, G., Nil, Bourdon.
H.P.T., HP, G-EATN, London-Paris, 12.10-15.30, Nil, 6, Bager & 1.
H.P.T., DH9, G-EAUI, London-Amsterdam, 16.05—, G.&M., Nil, Jones.
H.P.T., DH9, G-EAUN, Amsterdam-London, 11.22-1340, M., Nil, Rogers.
H.P.T., HP, G-EATM, London-Brussels, 14.40-18.00, G.&M., 5, Olley & 1.
H.P.T., HP, G-EASY, Paris-London, —16.00, G., 5, Willcockson & 1.
H.P.T., DH9, G-EATA, Brussels-London, 15.25-17.45, Nil, 1, Hope.

AUGUST 28th:

H.P., DH4, O11, London-Brussels, 10.25-13.45, Nil, 1, Willcockson.
H.P.T., HP, G-EALX, London-Paris, 12.10-15.00, G., Nil, Beal & 1.
H.P.T., DH9, G-EAUP, London-Brussels, 15.15-17.50, G.&M., Nil, Rogers.
H.P.T., DH9, G-EAUN, London-Amsterdam, 16.15—, Nil, Nil, Moore.
H.P.T., HP, G-EATN, Paris-London,—16.05, Nil, 8, Bager & 1.
H.P.T., DH9, G-EAUI, Amsterdam-London, —16.25, M., Nil, Jones.
M.A., Breguet, F-CMAC, Paris-London, 12.30-17.20, G.&M., Nil, Chailloux
H.P.T., HP, G-EATN, Brussels-London, —18.05, G.&M., Nil, Olley & 1.

AUGUST 29th:

H.P.T., HP, G-EASN, London-Paris, 12.10-15.15, Nil, Nil, Perry & 2.
H.P.T., HP, G-EATG, Paris-London, 12.15-16.10, Nil, 4, McIntosh & 1.
H.P.T., HP, G-EALX, Paris-London, 12.30-16.20, Nil, 10, Beal & 1.

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.

Where times are missing it is probably owing to Atmospherics affecting signals; "1" denotes an extra mechanic

Inland Flying at Croydon.

Aug. 23rd.—A.T.T., Avro, 1 joy-ride.

Aug. 24th.—A.T.T., 2 tests, D.H.9; Bristol, return, D.H.9. H.P.T., Ltd., 1 Avro, return Cricklewood; 1 D.H.4 to Cricklewood.

Aug. 25th.—Nil.

Aug. 26th.—A.T.T., Avro, 5 joy-rides; I.A.L., D.H.4, photography, 1 test.

Aug. 27th.—M.W.T. Co., D.H.6, 1 test. A.T.T., Ltd., D.H.18, 1 test; D.H.9, 1 test; D.H.9, 1 joy-ride

Aug. 28th.—I.A.L., D.H.4, 2 joy-rides; D.H.4, Margate, return.

Aug. 29th.—I.A.L., "Vimy," joy-riding. Mlle. Boland (Caudron), stunting. M. Maicon (Caudron), stunting.

Inland Flying at Cricklewood.

Aug. 23rd.—Two D.H.4s and one Aero test.

Aug. 24th.—Handley Page from Croydon; Handley Page test; Avro to Croydon, return.

Aug. 25th.—Handley Page and Avro test

Aug. 26th.—R.A.F. Bristol fighter from Farnborough, return; D.H.9, test.

Aug. 27th.—Two D.H.4s, three tests: Handley Page, test

Aug. 28th.—Handley Page W.8, from Martlesham with 11 passengers, including judges and rival competitors from Competitions; D.H.9, test.

The Air Port of Croydon.

The great event of the week has been the arrival of Mdlle. Boland on her Caudron biplane. For some time past her journey to London has been "incessantly expected," but until Saturday last each attempt, if seriously made, failed. Her first flight to England ended at Antwerp, and her second at Le Crotoy. In the third she rediscovered Issy les Moulineaux, where aviation fatalities are few owing to the lack of space in which to crash with satisfaction.

She reached Croydon from Lympne at 18.30, after a flight of an hour. In attendance was a two-engined Caudron biplane of the latest type. As the two machines neared Croydon the air port authorities in their joy fired two rockets. Pleased with this expression of international amity the two-engined Caudron made a good landing, followed a few minutes later by that of Mdlle. Boland.

On Sunday she flew for a short space to give joy to about a thousand spectators.

An Anniversary.

On Aug. 26th the air line organised and controlled by Aircraft Transport and Travel, Ltd., completed its first year of existence. The Aircraft Manufacturing Company, Ltd., one of the first aeronautical businesses of note in Great Britain, after supplying the British Forces in the field with some of the best aircraft the world has seen, boldly announced its intention of running a daily London-Paris air service. Among those best qualified to judge there was considerable scepticism as to the possibility of ensuring regularity on such a service. But despite all doubts the service came into existence, was given the Royal Mail contract, and in its first month proved that regularity was possible and that there was a section of the public sufficiently intelligent to make use—even at the high prices then obtaining—of the new means of transport.

The installation of such a service with no precedent on which to base figures of operation and ratios of profit not only required courage but also a free expenditure of money. Profits—even of meagre dimensions—could not be expected in the early stages of the venture and there were many contingent expenses impossible to foresee.

After a successful demonstration of regularity and safety over a period of months the Aircraft Manufacturing Company, Ltd., had perforce to combine with larger monied interests and in consequence were absorbed by the B.S.A. Company, who, unwilling to be pioneers in a new and vital industry, discontinued the construction of aircraft, and at one time appeared to contemplate the closing down of the London-Paris air route in so far as A.T. and T. were concerned. Wiser counsels prevailed and to-day Aircraft Transport and Travel, Ltd., continues its good work on the air mail routes.

The courage and prescience of Mr. Holt Thomas and his co-directors in the dark ages of last year must be recognised, and a debt of gratitude to them acknowledged. It is regrettable that having passed from these things they will not share in the rewards ultimately to be derived from civil aviation.

The chief praise must, however, be given to the pilots whose determination and skill have brought aerial transport into a scale of regularity and safety almost comparable with railways and steam packet lines. Prominent among these pilots is Mr. Shaw, now chief pilot and *"chargé d'affaires"* at Croydon, who has made more trips on the air line than any other. Other pilots who have done their share in the work are Messrs. Game, Tebbitt, Robbins, Armstrong, Powell, Lawford, Holmes, Bradley, Bamber, Reeve, Lines, Forson, Milnes, and Carter. Also one must not forget those who were with the company at the start but are now elsewhere. Mr. Frank Courtney, who flew the first D.H.18 and recently won the Aerial Derby, Messrs. Donald Lindley, McMullin, Campbell Orde, Gathergood, and others.

Also Mr. Brennard, to whom has fallen the brunt of the secretarial work. In France Mr. Bayliss has been in charge of A.T. and T. affairs at Le Bourget.

Their regular aerial routes now run to Paris, Brussels and Amsterdam. Machines of the company have also been on special work to Copenhagen, Prague and other distant capitals.

In conclusion one wishes the best possible luck in the future to the first aerial mail company to be formed in Great Britain.

Mr. Cyril Holmes' Accident.

In the issue of THE AEROPLANE for Aug. 18th, in the account of the mishap to the D.H.18 piloted by Mr. Cyril Holmes it was stated that "the most likely cause of the accident seems to be that the ignition was not sufficiently far advanced when starting."

At the time of the accident one was unable to obtain details from Mr. Holmes personally, and so one relied on information given by those who examined the machine after the crash. The ignition lever was then found to be retarded; but Mr. Holmes pulled this back *after* the crash, in order to get at the fire extinguisher in case of fire.

One offers every apology to Mr. Holmes for making this statement. It seemed very unlikely that a pilot of his calibre would do such a thing, but in the absence of an official statement as to the causes of the accident at the time of going to press one had to get one's information elsewhere.

One has since learnt from Mr. Shaw that the cause of the accident was partial seizure of the engine. Three of the pistons were chipped and damaged generally. The Air Ministry is at the moment holding an inquiry into this, and doubtless the result will be announced in due course.

Mr. Holmes' actions when he saw a crash was inevitable have only increased his already high reputation as a pilot. He turned what should have been a serious accident involving loss of life into an absolutely innocuous one, as regards himself and passengers.

This is his first accident in four years' continuous flying. He was severely wounded in the leg while serving in the infantry in the early days of the war, and afterwards joined the R.F.C. and learnt to fly at Shoreham in the autumn of 1916. From that time on he was continually on war flying,

and after the Armistice joined a communication squadron. One would like to take this opportunity of wishing him every success in the future.—G. D.

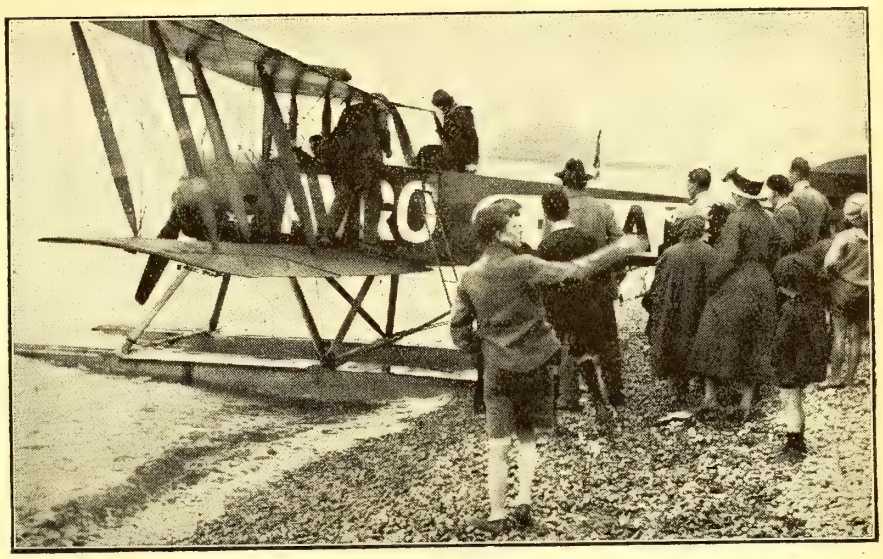
The Instone Air Line.

During the week the Instone Vickers "Vimy" (alias "Little Jimmy") has, in addition to its usual London-Paris trips, been engaged in transporting *Evening News* photographers to previously undiscovered parts of London. Directors of the line have also taken the air in this machine.

The D.H.4, piloted by Mr. Barnard, on Aug. 23rd went to Brussels, thence to Paris and so back to London at an average flying speed of 140 m.p.h.

In the same machine on Saturday last Mr. Barnard gave the "baptism of the air" to an enthusiast who, in order to avoid air sickness, kept his head between his knees throughout the flight. Beauty and her sister also had aerial baptisms during the same afternoon.

Later in the day Mr. Barnard demonstrated the inexhaustibility of the national food supplies.—NOT G. D.



Major Ferrand embarking passengers in the Avro seaplane.

The Air Port of Cricklewood.

During the week an Avro was flying low over the house when the engine cut out and it was forced to land in a school playground. Fortunately no one was hurt.

Live lobsters arrived by air during the week end and the W.8 returned from the Government competition. It is rumoured that this machine will attempt the flight round the world.

Handley Page GEATL flew to Lausanne (not Lucerne) on Monday.—G. D.

Folkestone.

Since the second week in July an Avro seaplane, owned by Mr. S. A. Martindale (late R.F.C. and R.A.F.) and flown by Major J. P. B. Ferrand, D.S.O. (late R.N.A.S. and R.A.F.), has been operating from the beach between the Victoria and Harbour Piers. In spite of the very bad weather, which rendered three out of the six weeks impossible from the point of view of flying, a considerable amount of work has been accomplished, well over 350 passengers having been taken up, without a single mishap.

The success of the venture has been largely due to the enthusiasm of the owner and pilot, who have been most ably supported by their small band of mechanics and night watchmen, all of whom have had long Service experience and have got their work keenly to heart.

Mention might also be made of the keenness shown by the Mayor of Folkestone as compared with the indifference of the other local authorities, who, although they are not putting anything in the way, are certainly not giving the enthusiastic support that one might expect from any other fashionable and progressive seaside resort.

It is extraordinary to notice as the results of statements made upon the return from a flight by certain passengers, the amount of good work a combination consisting of a sound organiser, an able pilot, an efficient machine, and a conscientious crew can do. One overheard people saying after divesting themselves of the leather flying coat and cap provided for use and their 25s. (not provided) that flying would certainly be their means of transport should they go to the Continent at any future date. This latter detail is probably accentuated locally by the fact that on a clear day the coast of France is clearly visible and also by the considerable activity displayed by the Continental air lines, most of whose machines cross the English coast somewhere between Dungeness and Dover.

Consequently one is not surprised to hear that Messrs. Martindale and Ferrand are formulating schemes of expansion, of which mention will be made when the time comes.

Incidentally one noticed on seeing "Going Up" at the local theatre at Folkestone that a Whitehead biplane (somewhat moth-eaten) is still used by Mr. Bobbie Street in his race with M. Gaillard. It seems a pity that the Whitehead Aircraft, Ltd., are defunct, otherwise they might claim this as a record of consistency and good workmanship.—L. B.

TO R.N.A.S. OFFICERS AND MEN.

The attention of readers of THE AEROPLANE, especially those readers who served in the R.N.A.S. and its off-shoot, the Royal Naval Armoured Car Division, is directed to the letter signed by Rear Admiral Murray F. Sueter, C.B., which appears hereafter.

In these days many people who were generous during and immediately after the war are themselves so hard up that they cannot subscribe to charities as they would like to do. Also there are so many calls on the charitable on behalf of charities which are really singularly undeserving.

There is to-day more truth than ever in the old saying that charity begins at home. Why should English people subscribe to save starving Armenian children in order that they may grow up merely to provide sport for a future generation of Turks, who have themselves grown up to kill Armenians through being saved from starvation probably by the very same charitable institution which is now providing them with Armenians to massacre?

Likewise, why should charitable English people save starving Bolshevik children, and starving Polish children, and starving Czecho-Slovakian children—who incidentally one hears are extraordinarily well fed without any need for charity—in order that they in turn may grow up to swell the armed forces of the Slav Napoleon of a few hence, and so help to kill the only sons of the young British mothers of to-day.

Surely it is better that such little money as we poor middle-class people have left to us by our democratic Government in its effort to make us support the mob of voters who are unwilling to work, should be devoted to helping those men who fought for us and suffered for us during the war.

Therefore one recommends any reader of this paper who has any money to spare for charitable purposes to hand it over to the Village Centres Council for the R.N.A.S. Memorial.

It stands to reason that the major portion of such money as may be available has already gone to the R.A.F. Memorial Fund, but one feels sure that those officers and men now in good positions who served under Commodore Sueter when he, by his intelligent policy, gave us the finest Naval Air Service in the world and incidentally saved the British Aircraft Industry so that it in its turn was able to save the British Army in the field, will be glad to acknowledge their debt of gratitude to Rear Admiral Sueter by doing as he wishes.

26th Aug., 1920.

Sir,—It is proposed to inaugurate a memorial to the officers, warrant officers, petty officers and men of the Royal Naval Air Service and the Royal Naval Armoured Car Division who fell in the war, the memorial to take the form of a row of cottages, with an inscribed tablet, on the Enham Village Centre Estate, for disabled ex-Service men, at Enham, Andover, Hants.

Although these two offshoots of the Royal Navy ceased to exist as separate units before the end of the war, I feel sure that those who served in them will be glad of this opportunity of perpetuating the memory of their comrades who fell in every part of the world where the Royal Navy and the Army were engaged.

Cheques and postal orders should be sent to Sir Frederick Milner, Bt., or G. Bromley Martin, Esq., Village Centres Council, 10, Upper Woburn Place, W.C.1, and crossed National Provincial and Union Bank of England, Ltd., and envelopes marked R.N. on top left-hand corner. As a complete list of donations will be published it is hoped to arrange a reunion in London through the record which will thus be obtained.

(Signed) MURRAY F. SUETER, Rear Admiral.

P.S.—Colonial papers please copy.

NAVAL AND MILITARY AERONAUTICS.

[R.A.F. Appointments and Personal Notices will be found on p. 466.]

NAVAL

ADMIRALTY APPOINTMENT

The following appointment has been made:—

Aug 28th.—The undermentioned has been apptd. as Prob. Mid., Seny Sept 1st, and apptd. as follows:—A. S. Winton, to *Argus*.

MILITARY

WAR OFFICE COMMUNIQUES

Aug. 26th.—The situation in Mesopotamia, according to reports dated the 24th, continues quiet. Aeroplane reconnaissance on the Lower Euphrates reported no hostile movement. . . . Our aeroplanes inflicted over eighty casualties on a hostile concentration near Bakuba. Many of the tribesmen in this area are returning to their homes.

THE CASUALTY LIST.

Reported Aug. 30th.

Previously reported Missing, now reported Killed: Fletcher, Sec. Lt. G. H., W. York. R. and R.F.C.

An Official Statement.

On Aug. 28th the War Office issued a statement regarding affairs in Mesopotamia, in which the following paragraph appeared:—

> The situation on the Shatt-el-hai is reported critical, and the Political Officer at Shatra, 35 miles north of Nasiriyeh, is being withdrawn by aeroplane to Nasiriyeh.

Air Raids in Mesopotamia.

It was reported from Teheran on Aug. 26th that heavy bombing raids had been made by British aeroplanes upon Bakuba, north-east of Baghdad, and near Hilla.

AIR FORCE.

OFFICIAL COMMUNIQUES.

R.A.F OFFICERS' COMMISSION PAPERS.

The Air Ministry announced on Aug. 25th:—

Several announcements have been issued to ex-R.A.F. Officers requesting them to forward their present addresses in order that the Air Ministry may be able to complete the dispatch of their formal Commisisons in the Royal Air Force. Of those issued more than a thousand have been returned, and in addition there are several thousands of Officers whose addresses are unknown. Amongst them are about 2,000 Colonial Cadets who were given Honorary Commissions after the Armistice.

It would greatly assist the Air Ministry if all ex-Officers who have not yet received their formal Commissions would forward immediately their addresses to the Secretary, Air Ministry (S. 7), Kingsway, London, W.C. 2.

Investitures.

It is officially announced that to facilitate the distribution of war decorations nobody will be summoned to a Royal Investiture if he has been awarded a degree of an Order below that of Commander or Companion, or the first class of the Royal Red Cross.

Those who have been awarded other decorations will have the option of receiving them at investitures in the counties in which they reside or of having them sent by post. The county investitures will be held by the Lords Lieutenant, but only in cases where it is found that a sufficient number of recipients desire to be present.

Those in the Royal Air Force wishing to attend these investitures should send their full names and postal addresses (specifying counties) to the Secretary, Air Ministry, Kingsway, London, W.C.2.

Those who prefer to receive their decorations by post should similarly communicate with the Secretary at the address given, stating their desire. No applications are necessary in the case of those who have been awarded the Civil O.B.E. and M.B.E.

An Instructional Flight.

On Aug. 26th H.M.A. R.32 left Howden at 20.30 on a twenty-four hours' instructional flight. After flying over the East Coast, London was reached at 09.00 the following morning. The airship then returned to her base. The vessel carried the United States crew of the airship R.38.

Cricket.

In a cricket match, the Army v. the Royal Air Force, played at Kennington Oval on the 25th and 26th Aug., the Army won by an innings and 171 runs.

Wing Commander Roche scored 48 out of a total of 123 in the first innings, and Squadron Leader Blount 21. In the second innings, out of a total of 168, Squadron Leader Blount was responsible or 46, and Flight Serjeant Charters 39.

For the Army, who compiled 462 for six wickets, Mr. P. V. Williams scored 138, and Major C. L. Tudor also scored a century making 111 runs.

Capt. Dickinson, who led the attack for the Army, was mainly responsible for the collapse of the Air Force team.—

G. D.

IRELAND.

Aircraft in the Irish War.

According to the *Daily Mail*, military correspondence in Ireland is now being conveyed to its destination by aeroplanes, owing to the increasing number of raids on mail trains.

A Fatal Accident.

It is stated in the daily Press that on Aug. 28th an aeroplane flown by Lieut. Norman B. Dimmocks, R.A.F., met with an accident at the Castlebar Aerodrome, Co. Mayo. Mr. Dimmocks was seriously injured and the passenger, Major H. F. Chads, M.C., 2nd Bn., Border Regt., was killed.

[No officer of the name of "N. B. Dimmocks" appears in the current "Air Force List."—Ed.]

AFGHANISTAN.

It was reported from Lahore on Aug. 24th that a Russian aviator had contracted to fly for the Ameer of Afghanistan, but afterwards discovered that the Afghans possessed no aeroplanes. The Russian, it is understood, is now not allowed to leave the country.

ARGENTINA.

The Argentine correspondent of THE AEROPLANE wrote on July 27th:—

An Accident.

Lieutenant Fitzsimon, of the Argentine Navy, crashed badly a few days ago while making a trial flight on a hydroaeroplane along the Rio Plata. The pilot and his observer were both badly knocked about.

FRANCE.

Recruits for Naval Aeronautics.

The Ministry of Marine has addressed a circular to Vice-Admirals, Commanders-in-Chief, and Maratime Prefects stating that applications from personnel to be posted to aeronautical units have now been exhausted. It is desired that applications from officers, warrant officers, and other ranks should be submitted at once, especially of those who have special qualifications in wireless, as mechanics, in gunnery, as steersman, etc.

ITALY.

The Surrender of a Zeppelin.

The Zeppelin airship L.61, assigned to Italy in accordance with the terms of the Treaty of Versailles, arrived at Milan on Aug. 28th. The vessel was on her way from Lake Constance to Ciampino, near Rome. The crew consisted of Germans officered by Italians. This airship is to be used by the Italian Royal Navy.

PERSIA.

A Raid on Enzeli Harbour.

On Aug. 25th, British aeroplanes from Kasvin raided the shipping in Enzeli Harbour. Two direct hits upon oil ships were obtained. It was observed that the shipping in the harbour had increased, but the reason of the increase was not evident.

POLAND.

Optimism!

An interview was given to a *Morning Post* representative on Aug. 16th by Miss Margaret Clifford, a daughter of Mrs. W. K. Clifford, the novelist. She has just returned from Poland, where she stayed for some months with her Polish relatives. In the course of the interview she made the following statement:—

"My Polish friends were very anxious about the lack of assistance from England. They said, 'If you will only send us 1,000 aeroplanes we can win the war for ourselves and scotch this Bolshevist snake.' "

The belief in aeroplanes is gratifying, and there is no question that 1,000 aeroplanes with the *necessary personnel and extraneous material* would bring victory to the Polish arms. As expressed, it is a good example of the loose thinking common in these days. One thousand aeroplanes alone would be entirely valueless. To make them effective at least 2,000 trained aeronautical officers (including pilots, providing all pilots are officers), and 20,000 other ranks would be required. Transport in proportion would be necessary, and the consumption of petrol if proper use were to be made of the aeroplanes would amount to, at the lowest estimate, 40,000 gallons a week. Ease in talk is not always ease in execution.

RUSSIA.

Some Bolshevist Raids.

It is reported that Bolshevist aircraft on the Dnieper front have recently made a number of bombing raids upon the forces of General Wrangel. This is claimed to be an innovation on this front.

UNITED STATES OF AMERICA.

Torpedo Aircraft.

The U.S. Navy Department has placed an order for nine torpedo-aeroplanes with the Curtiss Engineering Corporation and another order for six torpedo-aeroplanes from the Stout Engineering Co. of Detroit, Mich. These aircraft are destined for the U.S. Navy.

U.S.A. R.38.

It was reported in the Press on Aug. 19th that the airship R.38, now undergoing construction in England, will be ready for trials in early November. The flight across the Atlantic will probably take place in April or May of next year. Details of this airship have already been published.

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THE GORDON BENNETT RACE.

The Gordon Bennett air race of 1920 will be contested at Etampes on Sept. 28th, the second day of the meeting. So far as is at present known, four countries will participate, England, France, Italy and America; all have machines ready.

England will be represented by Mr. F. P. Raynham on the Martinsyde "Semiquaver" with 300-h.p. Hispano Suiza, on which Mr. Frank Courtney won the Derby. (No! Spion Kop won the *horse* Derby.) Mr. Tait Cox on the Nieuport "Goshawk," with 340-h.p. A.B.C. "Dragonfly," will also fly. This is particularly good news, since one was afraid that this machine would not be entered, owing to the closing of the Nieuport firm. However, arrangements are practically settled, and barring accidents the machine will fly. It is to be hoped that Mr. Tait Cox's bad luck will take a holiday during the race.

The third British entry is Mr. H. G. Hawker on the Sopwith "Schneider" machine in which he flew (approximately) round the Aerial Derby course and part of the Schneider Cup course. The machine will now be fitted wth a 450-h.p. Bristol "Jupiter" engine. Provided Mr. Hawker uses the correct course and flies past the correct winning post, this machine, though not boomed like the American entries, should stand an excellent chance for the race.

In Mr. Hawker, Mr. Tait Cox, and Mr. Raynham, England has some excellent material, and, given no engine trouble, it is to be hoped that the Gordon Bennett race of 1921 will be flown in England.

Of the other entries, America's three are from the Dayton-Wright Company, the Curtiss Company and U.S. Army Air Service

The Dayton-Wright entry is a monoplane with a retractable undercarriage and variable camber, fitted with a 250-h.p. Liberty engine According to the official account the monocoque fuselage is so tightly bound with fabric and glue that "no mummy was ever bound up so tightly as this hollow body of the speed plane." A mental picture is conjured up of technical officials of the company measuring the tension of the bindings of mummies in various museums to see that none are tighter than their "speed plane." The "ship" is called the "R.-B.," and the pilot is Mr. Howard M. Rinehart.

The company *claim* that the retractable undercarriage adds 30-35 m.p.h. to the speed of the machine. The added speed of *dropping* the undercarriage on the Sopwith "Atlantic" machine was found to be about 7 m.p.h.

The Curtiss entry is a 400-h.p. Curtiss-engined monoplane named "Texas Wildcat." This machine will be flown by Roland Rohlfs. When the machine was christened by Mrs. Cox, the wife of the entrant, real champagne was used. If this is the only use to which they can put "fizz" in a country where it is scarce, they deserve to go dry!

The third entry is from the McCook experimental station. It is a biplane designed by Mr. Verville, with a 600-h.p. Packard engine. It is very satisfactory to see officialdom taking part in international sporting contests.

The French and Italian entries will be dealt with later, as no details are to hand. One understands that there is also a possibility of a Swedish machine competing.

It has been suggested that the Gordon Bennett race should be for passenger-carrying machines or a race for "fat porters." One can imagine that the event would be most thrilling if England were represented by a Handley Page O400, France by a Farman "Goliath," America by a Martin Bomber, and Italy by a Caproni. To lend colour to the proceedings a Bolshy on a Sikorsky would be great fun, especially if he did not win the race, when he would probably indicate his displeasure to the judges with that old-world charm of manner and courtesy for which they are so well known and of which manner they and the Irish are the last surviving practitioners.

One would also point out that the Bolshies have a very competent and experienced pilot in Mr. L'Estrange Malone, M.P., who, with the help of the little grey books for which he has been so splendid an advertisement, would doubtless carry all before him, especially if he took the Council of Action as passengers.—G. D.

THE ROYAL AERO CLUB.

INTERNATIONAL AIR RACES.

The Racing Committee of the Royal Aero Club has selected the following competitors to represent Great Britain in the race for the Gordon Bennett Aviation Cup, which will be held at Etampes, France, on Sept. 28th, 1920:—

Pilot—H. G. Hawker. *Machine*—Sopwith "Jupiter." *Engine*—450-h.p. Bristol "Jupiter."

F. P. Raynham. Martinsyde "Semiquaver." 300-h.p Hispano-Suiza.

L. R. Tait Cox. Nieuport "Goshawk." 320-h.p. A.B.C. Dragonfly.

It is regretted that up to the present no British entries have been received for the Jacques Schneider International Seaplane Race, to be held at Venice on Sept. 19th, 1920.

Aug. 26th, 1920.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Aug. 24th.

ROYAL AIR FORCE.—PERMANENT COMMISSION.—Flying Officer F. Keith (A.) resigns his permanent commn., and is permitted to retain his rank, Aug. 24th.

SHORT SERVICE COMMISSIONS.—Flying Officer B. G. Bryan (T.) resigns his short service commn., and is granted rank of Flt. Lt., Aug. 25th.

The following resign their short service commns., and are permitted to retain their rank: Flying Officer W. E. Humphreys (T.); Obsr. Officer R. A. Brunton, M.C., Aug. 24th.

FLYING BRANCH.—Flying Officer G. E. Creighton is restored to active list from half-pay list, Aug. 4th.

TECHNICAL BRANCH.—The following Pilot Officers to be Flying Officers, Grade (A.): A. C. Smith, Aug. 18th, 1919; G. J. Stroud, Oct. 1st, 1919.

AIR MINISTRY, Aug. 27th.

ROYAL AIR FORCE.—SHORT SERVICE COMMISSIONS.—The following officers are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their seny. in the substantive rank last held by them prior to the grant of this commn., except where otherwise stated:—

Flt. Lt.—C. C. Clark (A.), Aug. 23rd.

Flying Officers.—H. S. Broughall, M.C., (A.), July 21st; G. P. W. Chandler (A.), Aug. 23rd; A. C. Clinton (A.), Aug. 15th; R. T. Colley (A. and S.), Aug. 16th; F. C. B. Greene (A.), Aug. 10th; A. F. Ingram (A.), Aug 21st; C. Jackson (A.), Aug. 23rd; A. T. S. L. de Lacroix (A.), Aug. 23rd; E. R. B. Playford (A. and S.), Aug. 25th; A. L. Russell (A.), Aug. 23rd; W. M. Shoosmith (A and S.), Aug. 23rd; A F. White (A.), Aug. 23rd.

Flying Officers (from Pilot Officers). With seny. of the dates mentioned.—L. J. V. Bates (A.), Aug. 12th; W. E. Gandell, M.M. (A.), Aug. 17th; W. F. McManus (A.), Aug. 19th; N. V. Moreton (A.), Aug 18th; G. E. Pratt (A.), Aug. 13th; H. D. Wardle (A.), Aug. 18th.

Flying Officer J F. Herd (T.) is transferred to the Reserve, Class B., Aug. 29th.

The notification in *Gazette* of July 13th, appointing Flt. Lt. A. Watson, M.B. (Med.),) to a short service commn. is cancelled.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATH.

WALKER.—Lieut. Walter E. M. Walker, late London Scottish and R.A.F., who died suddenly on Aug. 22nd, was the youngest son of the late Rev. W. R. Walker, M.A., and Mrs. Walker, 5, Scarsdale Terrace, Kensington, and grandson of the late Walter Brodie, Orsett House, Hyde Park, and Eastbourne. He was 30 years of age.

ENGAGEMENTS

ACLAND—MARSHALL.—The engagement is announced of Flight-Lieut. W. R. D. Acland, D.F.C., A.F.C., younger son of Sir Reginald and Lady Acland, Cold Ash, Newbury, Berks, and Mary Strange, daughter of Mr. and Mrs. T. Marshall, Trelawny, Lee-on-the-Solent.

DAVIES—MONTGOMERY.—The marriage arranged between Comdr. R. Bell Davies, V.C., D.S.O., and Miss Mary Montgomery will take place on Wednesday, Sept. 29th, at 2 o'clock, at St. Mary Abbot's Church, Kensington.

MATHEW—ALEXANDER.—The marriage arranged between Flt. Lt. Cecil George Mathew, R.A.F., and Miss Emily Geale Hester Lowry Alexander will take place quietly at All Saints' Church, Childs Hill, N.W.3, on September 7th, at 1 o'clock. There will be no reception, but all friends will be welcome at the church.

MARRIAGE.

GROVES—STEEN.—The marriage took place on Aug. 28th at the British Embassy Church in Paris, of Group-Captain P. R. C. Groves, C.B., C.M.G., D.S.O., R.A.F., eldest son of Mr. J. Groves, late P.W.D., India, and Mrs. Groves, and Suzanne, daughter of Mr. T. E. Steen and Mrs. Steen, of Christiania, and 107, Rue de la Pompe, Paris. The Rev. C. T. K. Burwell officiated.

Among those present were Marshal Foch, General Duval, General Dumesnil, M. and Mme. Boovens de Bayen, General Belfield, General Desticker, M. and Mme. Pierre de Fouquieres, the Comte and Comtesse de la Terriere, and Sir Seymour King.

The bridegroom is the British Air Representative of the Permanent Advisory Commission for Military, Naval, and Air Questions on the League of Nations.

BIRTH.

LESLIE.—On Aug. 26th, at 3, The Leas, Folkestone, to Sqdn. Ldr. Sir Norman and Lady Leslie—a son.

COMING EVENTS.

SEPTEMBER.

1st, Wed.—British Government Competition, Amphibian Competition at Felixstowe begins.

5th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva.

18th, Sun, 19th, Mon.—Schnieder Cup Race at Venice

27th, Mon.—Gordon Bennett Cup Meeting at Etampes begins.

28th, Tues.—Gordon Bennett Cup Race at Etampes.

Last week.—Latvian Trade Fair, Riga, opens.

OCTOBER.

1st, Fri., 2nd, Sat., 3rd, Sun.—French Aviation Meeting at Buc.

2nd, Sat.—Gordon Bennett Cup Meeting at Etampes closes

23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.

23rd, Sat.—International Aero Exhibition, Prague, opens.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes

2nd, Tues.—International Aero Exhibition, Prague, closes.

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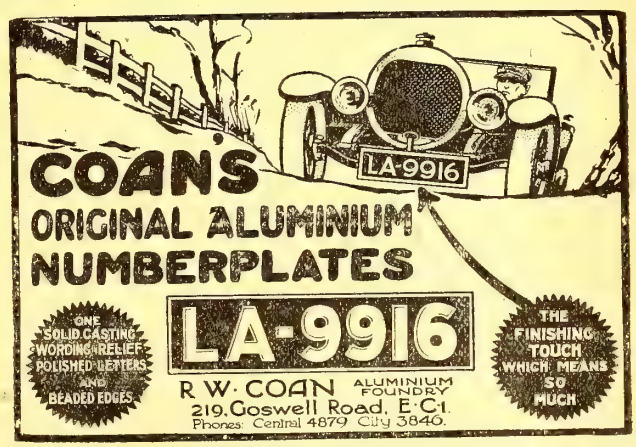

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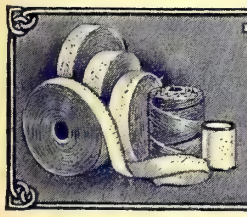

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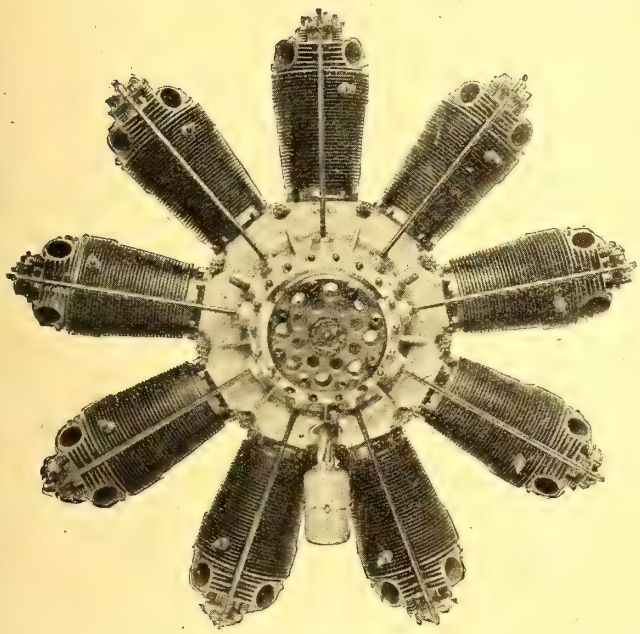

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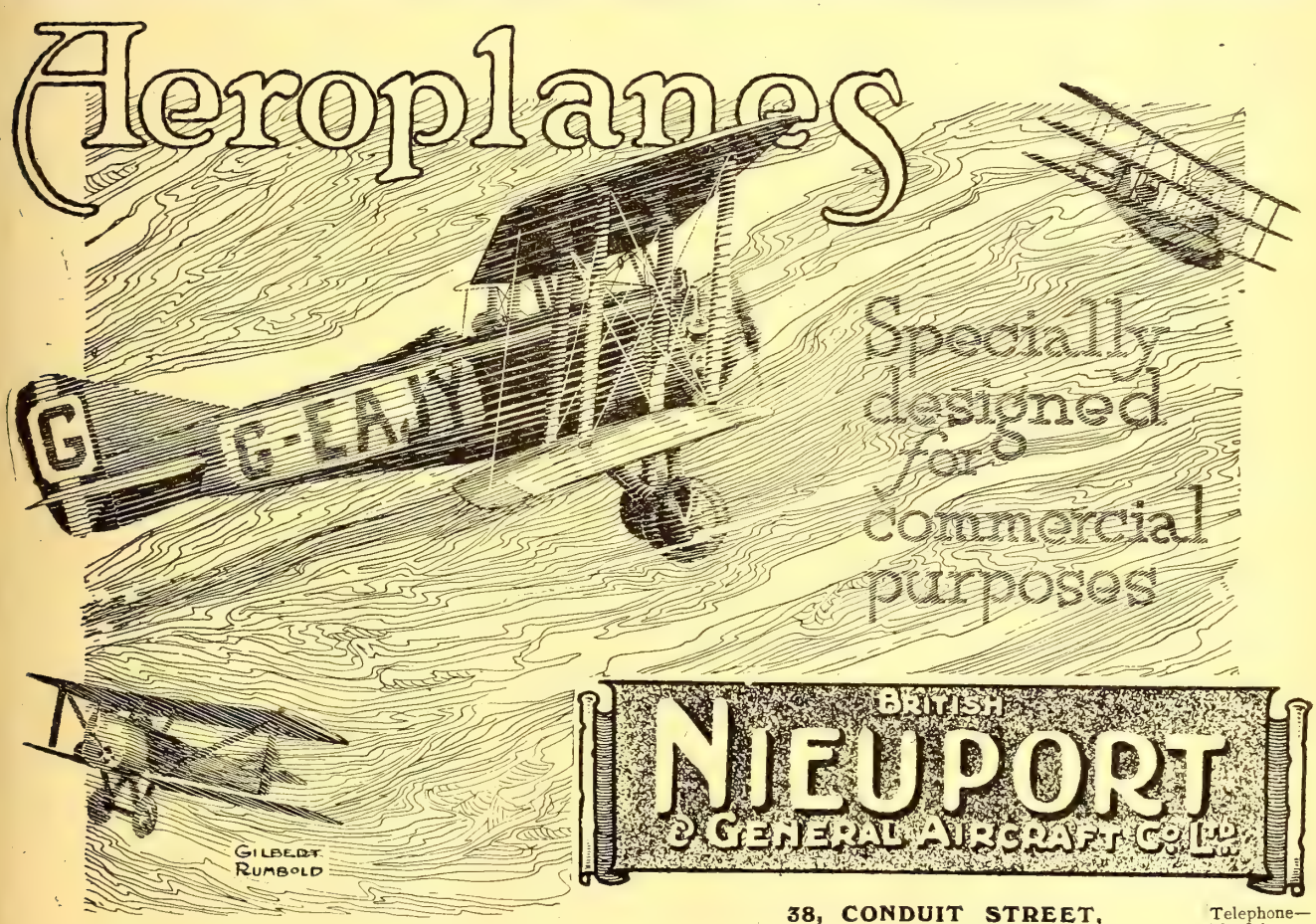

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SEPT. 8, 1920.

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ON AIR POSTS.

Seeing that the Amphibian Aeroplane Competition which was to have begun on September 1st has not as yet made any progress, "owing to none of the entrants amphing and only one of them biing up to the present," as one frivolous commentator remarked, there is nothing to report from Martlesham or Felixstowe. Therefore it seems well to return once more to the subject of Air Posts.

Few people seem to realise, even in the Aircraft Industry itself, that just at the moment Air Posts are more important to the future of aviation than anything else. There are in fact two distinct ways in which Air Posts are important. Firstly, as a means to an end. Secondly, as an end in themselves.

A Means to An End.

Let us first consider Air Posts as a means to an end, namely, the maintenance and magnification of Great Britain's command of the Air. It is fairly evident that if all the overland and oversea mails of the world were carried by aircraft a very large Aircraft Industry would be necessary to supply and maintain the machines used on these multitudinous air lines, even if not a solitary passenger or parcel were carried besides the mails. Therefore even the intelligence of an English business man ought to be able to perceive that the more mails are carried by aeroplane the better it will be for the Aircraft Industry, and the predominance of British Aviation.

The corollary to this is that the better the state of the Aircraft Industry the more capable that Industry will be of providing better and better aeroplanes and hydro-aeroplanes for the Royal Air Force. And thus, the greater the spread of air mail services the more we in this country are assured of that Command of the Air which in the future is going to be much more important to the integrity of the British Isles (leaving out the Overseas Dominions, who will have to bear their own troubles in this respect) than ever the Command of the Sea has been in the past.

Thus, as a means to an end, which will be of vital importance in the Great War against the Slavs in ten or twenty years' time, it behoves everybody to do their best to push forward the use of Air Posts.

Personal Interests.

It is, however, trying the Englishman rather too high to expect him to go out of his way to use, and to advocate the use of, Air Posts merely for the sake of posterity in the next war. As a famous Irishman once remarked, "What has posterity done for us? Why should we trouble about posterity?" Therefore it is perhaps wiser to emphasise the immediate personal advantages to be obtained from helping to popularise Air Posts.

The personal interest of the ordinary citizen is involved in Air Posts simply because if mails can be conveyed more quickly and cheaply by aircraft than by other methods (as they can be when properly organised) international business can be conducted more quickly and cheaply and efficiently and so the cost of living can be reduced.

The personal interest of the people concerned with the Aircraft Industry is self-evident, for if Air Posts were in general use all over the world, everybody in the Aircraft Industry would be busily employed at high wages.

Yet how many people, either in the Aircraft Industry or out of it, have made any serious effort to spread the knowledge that Air Posts actually exist on a scale which is already of serious importance to international commerce?

The Hundred "Best" Newspapers.

Some few weeks ago one made a serious attempt to interest the business community in the advantages of using the existing air mail services to and from Paris, Brussels, and Amsterdam. One hundred of the leading newspapers in Great Britain were selected for the experiment. To each of these was sent a copy of an article which appeared in THE AEROPLANE, setting forth what these Air Posts are already doing and how letters can be sent by air mail. With this was sent a copy of the weekly list of arrivals at and departures from Croydon and Cricklewood, just to convince the editors of those papers that the air mails really do arrive and depart. And these were accompanied by a covering letter asking the editors of these papers to deal with the subject as they thought best in the interests of British commerce.

About fifty of these papers were trade and technical journals selected from the membership of the British Association of Trade and Technical Journals, the other fifty were selected from among the leading daily and weekly papers in London and the Provinces. Of these hundred newspapers, so far as one has been able to discover, only four responded to the appeal.

The *Daily Express* published a short note on the subject. The *Financial News* mentioned the matter in its motoring notes, though one would rather have considered that international air mails were more concerned with high finance. The *Sphere* has published a most instructive and striking full-page picture by Mr. G. H. Davis, illustrating the working of the air mail lines. And the *Draper's Record* was so keenly interested as to publish a long article on the advantages of air mails to its own particular trade.

It is worthy of note that each of those papers is remarkable for its enterprise and initiative in its own line of business. The interest displayed by these papers in this subject and the neglect of their competitors to deal with it gives one some idea of the relative mentalities of our newspaper editors.

It is possible that some of the other ninety-six papers, each considered to be of importance in its own way, may have displayed similar intelligence. If so, one would be very glad to see what they had to say on the subject.

But it appears to be the lamentable truth that the great majority of the editors of those hundred leading British newspapers were mentally incapable of appreciating the value of Air Posts to the development of British commerce, or the value to the British Empire of a Command of the Air, both militant and commercial, analogous to the Command of the Sea which we hold for the time being.

The attitude of the typical newspaper editor may be gauged by the fact that one writer on aeronautical subjects in an important paper, to whom one appealed personally for help in this campaign, replied that he feared that his paper would not touch the subject as it had already been handled by another paper. That is to say, if a paper cannot put up a "stunt" itself it will not touch a subject, no matter what its national importance may be.

As Things Might Be.

It does not require a very brilliant imagination to see the effect which would be produced if fifty of our leading newspapers and fifty of our leading trade and technical papers embarked on a serious campaign to induce their readers to use the Continental Air Posts. The article in the *Draper's Record* summed up the present situation by saying that out of ten English business men five do not know that air mails exist, four regard them as an experiment or an advertising stunt, and the other one is quietly stealing a march on his competitors by using the air mails regularly.

In proof whereof one may mention the fact that a friend in the London, Liverpool and Globe Insurance Co., which firm does a big Continental business, said recently that his people use the Continental air mails regularly and save several days in every week's correspondence by so doing. Perhaps the L.L. and G.I. Co. may not thank one for thus giving away one of the reasons for its success, but one does so in the interests of aviation and not of its competitors.

Now if the 100 leading papers aforesaid all combined to impress on their readers the commercial and personal advantages to be gained by using the Continental Air Posts it is absolutely certain that in a very few months all letters to the Continent would go by aeroplane. For as soon as the ordinary business man realised that his competitors were securing an advantage over him by using the air mails, he would go and do likewise. And the result would be a general speeding-up of Continental business, much to the advantage of British Commerce, and incidentally to the advantage of those editors who are too obtuse to realise the fact.

The Fly in the Ointment.

But there is, of course, a fly in the ointment. One has given one instance of a firm which has found the regular use of the Air Posts very much to its advantage. Unfortunately people are apt to be influenced by first impressions, and it is not everybody who will go on using the air mails regularly if their first attempt is a failure. A case in point is of interest.

On Aug. 10th there appeared in the *Morning Post* a letter from Mr. E. M. Rodoconachi, of the famous house in Old Broad Street, advocating the revival of the night mail train and boat to Paris. One ventured to write to Mr. Rodoconachi and suggest that if he posted his late letters to Paris by the last post they would go by the 9.30 aeroplane next morning and would be delivered in Paris that afternoon, which was at least as quick as any night mail train service would get them delivered.

Mr. Rodoconachi wrote back on Aug. 16th saying that he had tried this method on the 12th and 13th, and that "the letters did *not* reach their destination in Paris *during business hours* the next day after posting." Reference to the Croydon time-table showed that on both the 13th and 14th the 09.30 aeroplanes reached Paris by 13.00 hours (1 p.m.) and therefore there was no reason why the letters should not have been delivered during business hours. The only possible explanation of the delay, therefore, was the carelessness—or the hostility to air mails—of the French Post Office.

Ancient Precedents.

Therefore one wrote to Mr. Rodoconachi pointing out these facts and also reminding him, in case he might feel prejudiced against air mails in future, that when the Post Office began running night mails by motor vans from London to Brighton there was quite an outcry against the occasional delays which occurred through breakdowns of the mail vans preventing letters which ought to have been delivered by the first post from being delivered till late at night or even till next day. Yet to-day all short-distance mail work is done by motor vans. And even now several times each year every motor mail service is held up by fog or snow, yet nobody objects and probably nobody even notices the delay.

One believes that in the early days of railways people actually protested against committing Her Majesty's Mails to the care of these stinking, erratic, fire-throwing monsters instead of to the safe and reliable horse coach. Those people were more justified in their disbelief in steam-engines than are those justified who disbelieve in the reliability of air mails.

However, it is satisfactory to note that on Aug. 23rd Mr. Rodoconachi wrote again saying that "a letter posted on the 16th Aug. was delivered at about 4 p.m. on the 17th" in Paris.

Those Blue Labels.

Incidentally he stated that his staff had applied at Threadneedle Street Head Post Office for the blue "Air Mail" labels —whose issue was notified by the Postmaster General on Aug. 17th—but were informed that they had none yet, though they were "expecting them." That, be it noted, was a week after the issue was announced.

Even now, more than a fortnight later one can only obtain these labels at some post-offices by demanding that the particular counter-hand concerned shall go and look for them. The staffs at the post-offices seem either very badly informed or singularly unintelligent on the subject of air mails. Still, after all, one can hardly expect a girl in a post-office to be more intelligent than the editors of most of our Hundred Best Newspapers.

The French Post Office Again.

Another complaint of delays in Paris came from Mr. E. Neele, of Moorgate Street, who pointed out—against the air mail—that letters posted in the ordinary way up to midday in London go by the 16.55 train from Victoria, arrive in Paris 05.00 next morning, and are delivered in Paris at 08.15, only three hours or so later. He said further, in a letter of Aug. 21st, that on each occasion when he had tested the 09.30 air service from London the letter has been delivered after ordinary business hours in Paris.

Also he added that the mail *via* le Havre, leaving Waterloo at 20.30 (posting in the City up to 17.30) reaches Paris shortly after midday and is delivered at 17.45 (5.45 p.m.). Against this one would mention that one crossed by this route just before Christmas last and again in March last. The first time the boat was an hour late and we did not arrive in Paris, owing to further delays on the railway, till 19.00 (7 p.m.). The next time, owing to bad weather, the boat did not leave Southampton till 05.15 the next morning, when it should have left at 23.00 hours the same night, and we did not arrive in Paris till 23.00 hours the following night, 27 hours after leaving London. On each of these days the mail aeroplanes left London and arrived in Paris on time. So one has not much fear of competition from the Southampton-Le Havre route.

A Sound Suggestion.

Mr. Neele makes the very sensible suggestion that there should be an air mail service which would allow of posting at the G.P.O. up to 10.30, leaving Croydon about midday, arriving in Paris about 14.30 or 15.00 hours so that letters could be delivered in Paris (by express if necessary) before 18.30 (6.30 p.m.) when the offices shut. He adds that before the war letters could be posted at the railway station in the morning and delivered in Paris the same evening.

Surely the Air Posts should be able to do so much as that. Something of the sort will be necessary during the next few weeks. When the days grow shorter and we revert to Greenwich time it will be necessary to knock off the 16.30 service in each direction, as it is not yet possible to fly with certainty in the dark.

Then the 09.30 mail machine can take the previous night's London mails, and the 12.00 machine can take early London letters and late letters from the Provinces. The sooner this re-arrangement of time-table is announced the better.

A Personal Test.

By way of fixing definitely the responsibility for these delays which do so much to harm the development of Air Posts, one wrote two test letters to that eminent publicist M. Roche d'Estrez, editor of the leading French aviation paper *L'Air*. One letter was posted late on Aug. 23rd, marked "Air Mail" and stamped accordingly. The other was posted in the ordinary way on the morning of Aug. 24th.

The former left Croydon by the 09.30 mail machine on Aug. 24th and arrived in Paris by about 13.00 hours. The other left London by the mail train leaving London at 16.55 hours, and arrived in Paris some time in the early morning of Aug. 25th. Both letters were delivered together to Mr. Roche d'Estrez in his office in the rue de l'Isly at 08.15 on the morning of the 25th.

It is not surprising that M. Roche d'Estrez replied, "Those who have not confidence in the aerial postal service have unhappily reason for their mistrust. You may depend upon me, on my side, to protest against such facts, which do grave damage to the commercial development of aviation."

The President of the Editorial Committee of *L'Air* is M.

Laurent d'Eynac, Member of the Chamber of Deputies and Vice-President of the Aviation Group in the French Parliament. It is to be hoped that he and M. Roche d'Estrez will bring this slackness—or hostility—of the French Post Office to the notice of M. Flandin, the keen and energetic Under Secretary for Air in the French Government.

A Matter of Policy.

It is to be hoped that on this side Sir Frederick Sykes, as Controller-General of Civil Aviation, will take the matter up through the Foreign Office and will lodge an official complaint against the French Post Office.

It would be well also if the Society of British Aircraft Constructors would take action in the matter, both by way of an official complaint to the Air Ministry and by way of a fraternal communication to the French Aircraft Manufacturers' Association, who can bring considerable pressure to bear on the French Government. It is directly in the interests of both French and British aircraft constructors that the French Post Office should be brought to book.

If only the Air Posts can be run with reasonable efficiency during the next year or two, and if only British business men can be taught that they can save time, and consequently money, by using air mail services, then not only will there be a vast increase in the number of aeroplanes used on the lines between London and the Continent, but there will be a still greater demand for aeroplanes to be used in Air Posts all over the world. And so prosperity may return to the Aircraft Industry.—C. G. G.

ON AIR LINES.

There is no getting away from the fact that the public is not using the Air Lines as it should, or even as it was expected to do. It is true that the average number of weekly machines to and from the Continent is about 120 and the average number of passengers is 250, but good as this appears to be, it is not good enough. Why, then, are the public not using the lines as they should?

There are three main reasons, all of which go to account for this. They are: (a) fear of the air, (b) lack of advertisement, (c) high prices. All of these working in with one another absolutely prevent the *ordinary citizen* from making use of the air as a method of transport, or shall we say making the man in the street the man in the air.

How is one, first of all, to eradicate the fear of the air from the people who have got to use the air? The simplest method seems to be to "get at" him through points (b) and (c). The surest way to "get at" any Englishman is through his pocket. If one can reduce the fares on air lines to *less* than those of the corresponding ground routes (and this is possible, laugh as you will, O average pioneer of primitive air-lines!), and one will then force the average English citizen into the air for the sake of economy. And economy has forced many people to do very much more uncomfortable things than fly.

One is told that the average traffic to Paris by earth in normal times is really very small. Perhaps it is. But if the journey to Paris is as short (in time) and as cheap as that, say, to Southampton, then the traffic will increase accordingly. Look at the number of people who go to Brighton and Eastbourne for week-ends or to lunch on Sunday. If they could go to Paris for lunch in the same time, for the same price, in the same comfort, is it not very likely that they would go in the same quantities?

Then there is the question of advertisement. Nothing probably breeds familiarity like advertisement. How many air lines at the present time advertise to any extent? A few stray advertisements appear in the daily and technical Press from time to time, but what there are are totally inadequate. To see this, one has only to spend a few minutes in an aerial booking agency. Watch the astonishment of inquirers when they are informed that three services leave daily for the foreign capitals at definite times, and that the passengers sit in nice comfortable cabins and do not have to wear special clothing. Sometimes passengers even think they are metaphorically having their legs pulled, and after a good laugh want to be told the worst at once.

To make air lines pay at the present moment advertisements of these should be everywhere. Selfridge's, the *Daily Mail*, and other successful business concerns only reached their position through thoroughly understanding the art of advertising and not being afraid of spending money on this vital branch of business. Several London hoardings should be plastered with air-line facts, every London and provincial news-sheet should blazon the fact that "47 generals and 9 admirals travelled by our air line last week." Prominent advertisements should be displayed in these giving accurate information about machines and times of running for the benefit of the man who wishes to know, for, strange as some people think it, it is to the papers that people turn and expect to find accurate detail information. If it is displayed in the foreign papers that "the Sky-Scooter Air Line is the line for gentlemen," when the man from abroad comes to England he will travel by the Sky-Scooter Air Line because it does not occur to him to travel by any other route.

Similarly if he reads continually that the "Parachute Booking Office is the place where everybody who is anybody books air passages" he will sub-consciously go there to book, as the name of no other office occurs to him.

There is a vast fortune in store for someone who runs an air line as cheaply as, or cheaper than, ground transport, and who is willing to allot a very large sum to advertisement. For the first year money will be lost, but after that it will pay its way until finally it will bring in millions to the far-seeing board of directors who have the courage to start on these lines.

Another point which is all involved in the same question is with regard to uniforms for the Civil Air Service. Here, again, the scoffing and omniscient will guffaw. But the Mercantile Marine all wear uniform closely resembling the uniform of the Royal Navy. Why, therefore, should not the personnel of an air line wear a uniform resembling that of the Royal Air Force? Smartness in machines and personnel very naturally increases the confidence of air travellers, and the whole appearance of an aerodrome is changed when the personnel walk smartly about in uniform. One has only to recall one's Service days, even in the latter parts of the war, to realise this truth.

This possibly will not appeal to the old hardened Service dodger who revels in answering back and accuses the pilots of having cold feet because they refuse to take off with a joy-stick with nine inches play.

One is told that one of the foremost air lines is already discussing this question with the Air Ministry. If this is so, one wishes them the best of luck and offers them congratulations for looking so far ahead.—G. D.

THE AIR MINISTRY COMPETITION.

The progress of the Air Ministry Aeroplane Competition (Amphibian Section) to Sept. 8th is as follows:—

ONE RESULT OF SUBSIDISING.—The Terminal Aerodrome of the Nice-Avignon Aerial Mail Line at Nice. The photograph shows the extremely bad state of the landing ground and the lack of adequate shed accommodation. In the centre is an antiquated war machine, which waddled off the ground without passengers or cargo, and flew to Avignon merely to qualify for the French Government subsidy.

NAVAL AND MILITARY AERONAUTICS.

[R.A.F. Appointments and Personal Notices will be found on p. 502.]

MILITARY

WAR OFFICE COMMUNIQUES.

Aug. 31st.—North of Baghdad the country is becoming more disturbed. Our aeroplanes scattered a body of tribesmen near Beled, and Samarra (respectively 50 and 70 miles from Baghdad) itself is said to be invested.

Sept. 1st.—No reports of fresh incidents have been received from Mesopotamia to-day. . . . Aeroplane reconnaissances are made periodically, and messages transmitted by the garrison by means of panel signalling. These indicate that all is well

Sept. 2nd.—The Muntafik Arabs, to whom political catchwords failed to appeal, have been roused by active preaching of a Jehad on the part of fanatics from Nejef and Kerbela (the Holy Places of the Shiahs); the leading Sheikh in the district, despite his unwavering friendship for us, has been unable to hold his men back, and the withdrawal of the British political officers at the last moment by air alone saved them from being murdered. . . .

North of Baghdad, Samarra was attacked by insurgents from 2 a.m. till 12.30 p.m. on the 29th; the ferry was captured, but retaken by our local levies. By the 30th, however, the tribesmen had dispersed, and aeroplanes reported no hostile movement to be seen.

Sept. 3rd.—North-west Persia.—On Aug. 30th aeroplane reconnaissance could discover no movements of troops or transport between Surmiru, Resht, and Enzeli, nor any signs of troops in camp at Resht.

The following communique was issued on Sept. 4th :—

Sept. 1st.—Lower Euphrates.—We carried out an air raid on concentrations in the neighbourhood of Samawah with effective results The machines were heavily fired on.

Kirkuk Area.—Rowanduz is reported to have been attacked on August 30th. Our aerial reconnaissances on August 31st saw no movement there.

Sept. 6th.—On Sept. 3rd, north of Baghdad a train which attempted to reach Beled from Samarra was fired on and compelled to turn back. Samarra itself is quiet and aeroplanes report the country clear of hostile bands.

Air Raids in the Near East.

It was reported on Aug. 30th from Headquarters, the North Persian Force, that the bombing raids on the Lower Euphrates and at Bakuba continue.

On Aug. 30th British aeroplanes again made a bombing raid upon the shipping in Enzeli Harbour.

AIR FORCE.

The R.N.A.S. and R.A.F. Felixstowe Dinner.

A Reunion Dinner will be held in the near future in London, open to all ranks, past and present, of the Felixstowe Air Station. Will all members interested kindly communicate with the Hon. Secretary, W. Kitson, 22, Manor Terrace, Felixstowe.

Missing Officers.

The following notice has been forwarded for publication :—

To all officers, chaplains and non-commissioned officers of the R.A.F.

Information urgently desired as to the number of the Squadron who sent a flight-serjeant and lorry to fetch the bodies of two flying officers from a dressing station known as "Smith's Farm," on the road between Corbie and Vaux-sur-Somme, on May 18th, 1918. These officers belonged to the 57th Squadron, and orders to fetch them were probably issued from H.Q. of the 9th Brigade, R.A.F.

Identification labels were missing and receipt given by the flight-serjeant was lost in action. These officers were probably buried behind the lines as "Flying Officers Unknown." Information as to the Squadron who sent lorry, or as to identity of flight-serjeant who fetched bodies, or chaplain who buried them, is urgently desired in order to trace place of burial. Such information to be sent to Messrs. Guedella and Jacobson, Winchester House, Old Broad Street, London, E.C.2.

It is stated that the missing officers are Capt. F. L. Mond and Lieut. Martyn.

IRELAND.

The Raid on Baldonnel Aerodrome.

A correspondent of THE AEROPLANE in Ireland writes :—

Sinn Feiners have succeeded in one of the most daring and important coups yet attempted, apparently without disturbing the guard. A Sinn Fein raid party broke into the R.A.F. headquarters at Baldonnel, near Dublin, during the night of Aug. 28th, and, rifling a safe, secured a large number of secret military documents, including the Army code and cypher. Among other papers stolen were operation orders relating to the joint working of the Army, Navy and Air Force and the R.I.C. The words, "Thank you.I.R.A.," were found written on one of the robbed files.—ERIN.

Other accounts state that the captured papers included a scheme for the defence of Ireland, plans for the lighting of aerodromes during night flying, and plans of the aerodromes under construction in Ireland. A number of revolvers and field glasses and a quantity of ammunition was also taken. A court of inquiry was held on Sept. 2nd, but the proceedings were not made public.

Group Captain Ian M. Bonham-Carter is commanding at Baldonnel.

A Fatal Accident

One is requested to state that Major Harry Francis Chads, M.C., late Adjutant of the Border Regiment, who was killed in an aeroplane accident at Castlebar on Aug. 25th, was not on a pleasure flight, but was returning from Dublin, where he had been ordered on duty. He was not about to proceed on leave, nor was he engaged to be married.

CHINA.

It is stated by a correspondent in China that the aeronautical department of the Chinese Government at Pekin is asking for pilots, either British or American. The salary offered is 500 dollars a month, with accommodation on arrival, free passage to China and insurance while there.

Affairs in China are a trifle involved as regards aviation, owing to the fact that various General Officers Commanding, Chinese Armies, appear to hold the Chinese Government under their control from time to time. Consequently the Chinese Air Force and pilots working therewith may possibly be under the command at one time of a general whose headquarters they were sedulously endeavouring to bomb a few weeks earlier.

Nevertheless, the true soldier is not really interested in the cause for which he is fighting so much as in the technical duties of a soldier, so that doubtless these appointments in China would be quite worth the attention of pilots who are fond of flying and are not tired of war.

Probably detailed information on the subject can be obtained at the Chinese Embassy, at 49, Portland Place, London, W.1.

FRANCE.

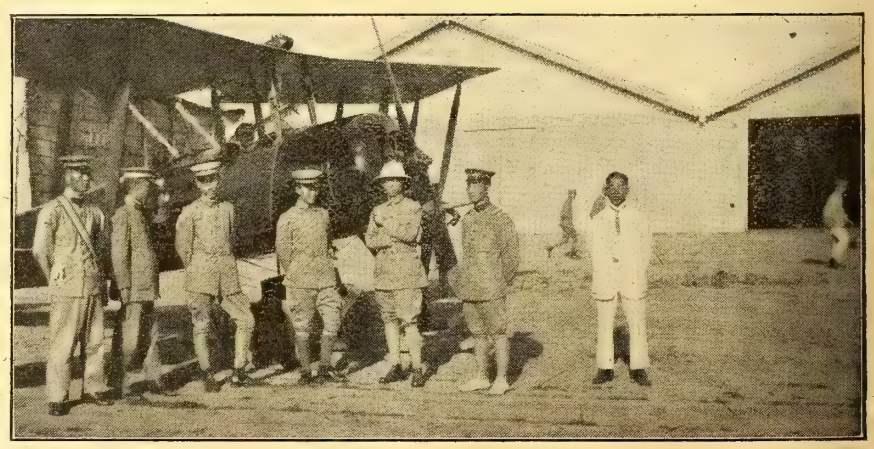
An Aeronautical Headquarters Staff.

It has now been decided that Military Aeronautics is to follow the example of Cavalry, Artillery, Infantry and the Engineers, and will have a General Staff of its own. (This will include an administrative staff.)

Personnel for these état-majors will be drawn from the following sources :—

(i.) Officers drawn from the general staff of the Army Corps.
(ii.) Commissioned professors or instructors from military schools, who will be seconded to these establishments.
(iii.) Officers already borne on the cadre of the états-majors, schools, establishments and services of military aeronautics.
(iv.) Officers seconded from l'administration centrale de la guerre.
(v.) Administrative officers drawn from the aeronautical arm or from batteries belonging to that arm.

SERVICE AVIATION IN CHINA.—Herewith are shown several Chinese officer-pupils at the Military Aviation School at Peking. The machine is an Avro sold to the Chinese Government by the Chinese Branch of Vickers Ltd. Pilot is the chief instructor at the school, Capt. Patteson, R.A.F.



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A Curious Accident.

On Sept. 6th an aeroplane piloted by Quarter-Master Réné d'Espieunes which was flying low over Montrouge fell into a school playground while the children were playing there. Four children were killed and a fifth child and the pilot were seriously injured.

GERMANY.

The Danish correspondent of THE AEROPLANE writes :—

Hope Springs Eternal.

Flugsport of Sept. 1st contains an advertisement reading, in translation, as follows :—

"When taken prisoner during a bombing flight on July 28th, 1918, at Mössingen Wood, North-West Oberndorf, in Württemberg, worthless things, yet of value to me, such as pilot's certificate, photo, leather helmet, goggles, etc., were taken away from me by a 'non-ordered' pilot (wrong translation for non-commissioned?) who forced me to land and flew a Albatros D.III. I shall be grateful to Persons who can assist me in recovering my things.—Mr. Frank E. Nash, 52, Leeming Street, Mansfield, Nottinghamshire (England). *Flugsport* forwards correspondence."

GREECE.

OFFICIAL COMMUNIQUE.

The Greek Legation in London received on Aug. 31st the following official communiqué from Greek Army Headquarters at Smyrna on the operations of Aug. 30th :

On occupying the aerodrome of Ouchak we found the remains of a burnt aeroplane and a large quantity of aviation material.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

The Arrival of L.61.

On Aug. 21st L.61 passed here on her way from Friedrichshafen to Rome flying very low and looking very deadly, nearly jet black in spite of a clear evening sunshine. Her journey over the Spluga Pass and *via* Como, Milan, Genoa and the west sea coast to Ciampino, took from 17.00 o'clock to 02.00 o'clock, she being, incidentally, the first airship to cross the Higher Alps. The vessel has been renamed *Italia*, and is attached to the Navy. The German Commander, Hans Flemming, and the Second-in-Command, Peter Fugwersen, are reported as saying that only one Zeppelin was employed in offensive operations against Italy; the one, then, for evident reasons, called an aeroplane, which did such havoc at Naples *en route* for Rome, and was brought down in flames on attempting to repeat the strafe the next night on leaving the Albanian coast. The German navigating crew of L.61 was 19 men, and only three or four Italian officers and officials travelled in the vessel. As is known, L.61 was built in 1917, is 196 metres long, has four nacelles, and five 240 h.p. engines, and operated over France.—T. S. H.

LITHUANIA.

The Polish War.

It is semi-officially announced that during the fighting between the Poles and the Lithuanian troops on the Grodno-Suwakki front at the beginning of this month, which resulted in the retirement of the former, Lithuanian aeroplanes made several reconnaissance flights.

POLAND.

There is considerable activity at Mokotow Aerodrome, near Warsaw. The Polish War has brought about a curious fraternisation of machines. Caudrons, Spads, Bréguets, Bristols, Sopwiths, Fokkers and Albatroses, are to-day operating side by side against the common enemy.

As the result of strenuous efforts Poland has been able to accumulate an air force of considerable power.

SOUTH AMERICA.

The Argentine correspondent of THE AEROPLANE writes :—

Development of Military and Naval Aviation in S. America.

The South American countries are showing a growing interest in aviation in these days. The position of the Argentine military flying school was described in a previous article. Brazil, Chile, and Uruguay and the other nations are rapidly enlarging their flying centres, and including fresh materials in their military schools, or creating others in various parts of the country.

A cable has arrived bringing news of these activities, and the last mail to arrive has given detailed information in this respect.

Brazil.

This country has just acquired from France a squadron of thirty machines, composed of fighters, bombers, and reconnaissance aeroplanes, all Bregnets and Spads.

In July, 1920, the Military Aviation School of Brazil, founded on July 10th, 1919, possessed thirty Nieuports of 150, 180, and 280 h.p. Notwithstanding the short time that has elapsed, the school, which is situated in the country district of Dos Affonsos, distant about 25 kilometres from Rio de Janeiro, has certainly attained importance. The school is carried out under the technical supervision of Colonel Magnin, of the French Army, Captains Lafay and Verdier, and Lieuts. Buisson and Dorsan, besides six mechanics. The first three named instruct in flying, and the other two in photography and mechanics respectively.

The programme of instruction comprises : Theory and practice of flight, direction finding, observation, bomb-dropping, photography, cross country, and assembling and dismantling machines and motors.

The aerodrome in which the school is situated is ten square kilometres in extent, and possesses nine hangars 30 metres by 30 metres each, built of reinforced concrete. There are no workshops yet, but in the yards of the Costeira National Navigation Co. an aeroplane has recently been constructed, under the guidance of Captain Lafay, and it has given good results on its trials. All the material used on this machine—except the motor—have been products of the country.

There is already a school of naval aviation, which functions on the island of Enxadas, inside the bay of Guanabara. Its complement consists of 20 hydroaeroplanes, Curtiss, Ansaldo, Macchi, Isotta Fraschini, and a Handley Page. It has acquired besides 20 Bristols, which will be embarked soon from London.

To-day Brazil has fifteen qualified officer pilots, who have been passed in the school as instructors for the new machines bought in France. Fifteen others have commenced their course of instruction, and three pilots from Uruguay have got their "brevets" in this school.

The interest of the Brazilian Government in the new arm can well be understood from the following paragraphs of the last presidential message :—

"For the programme of 1920-21 it becomes necessary to acquire a fighting squadron to be stationed at Rio Grande del Sur, and four reconnaissance squadrons, so that there will only be left to obtain in 1922 two more fighting squadrons and two more bombers."

Referring to the naval air service, he said :—

"Notwithstanding the cost of this service, it is without doubt destined to have extraordinary expansion, and it will be an advantage to increase it soon, in order to have aviation bases at fixed points along the coast."

Chile.

Aviation in Chile finds itself frankly progressive. The principal school is situated in Lo Espejo, 50 kilometres from Santiago. It actually possesses thirty new Bristols and Avros, besides other types less modern. It has a select nucleus of military aviators, who are making themselves familiar with the new types of machines, under English instructors. The Government has already sent some of these to Europe to receive higher instruction, among them being Captain Armando Cortinez, who has twice crossed the Andes. The navy also has its school situated in the neighbourhood of Valparaiso, where there are twenty new types of hydroplanes, received from England last year.

Uruguay.

This country also believes in pushing forward this new arm by obtaining a considerable number of machines. The military aerodrome is at Paso de Mendoza, a few kilometres from Montevideo, in a huge field very suitable for the purpose, with several hangars.—DUMSPIRAL.

UNITED STATES OF AMERICA.

A Lawn Tennis Disaster.

During the contest for the lawn tennis championship of the United States of America at New York two aviators who were watching the contest from an aeroplane were killed by their machine falling to the ground. Engine trouble was the cause of the accident. The aviators were Lieut. Grier, U.S.N., and Serjt. Saxe, U.S.A. They had been taking aerial photographs of the game.

AERIAL PHOTOGRAPHY.

Aerofilms Limited, the London Aerodrome, Ltd., have been honoured by the receipt of the following letter.

Buckingham Palace,
Aug. 29th, 1920.

Dear Sir,—

H.R.H. the Duke of York desires me to thank you for the aerial photograph of Windsor Castle which has been received, and with which he is very greatly pleased.

His Royal Highness considers it a most excellent piece of work and greatly appreciates your kindness in having presented it to him.

Yours faithfully,
(Signed) J. G. STUART,
Equerry.

NAPIER

450 H.P. AERO ENGINE

THE following Press comments on the performances of the Westland and Handley Page Aeroplanes—the only two with Napier Engines competing in the Government Aircraft Trials at Martlesham—show some of the advantages of fitting the Napier Aero Engine.

"This is a record for the meeting."
Times, 23/8/20.

"Easily the best that has been done during the trials."
Daily Telegraph, 16/8/20

An excellent performance was put up by Mr. A. S. Keep with his Westland Limousine, engined by a powerful 400 Napier Lion, and built by Messrs. Petters Ltd. In the high-speed and low-speed competition, in which machines are required to be capable of flying level with full load at or above 100 miles per hour, and at or below 45 miles per hour at ground level, Mr. Keep reached the high speed of 117.7 miles per hour, this being easily the best that has been done during the trials. His ... although not yet officially worked ...

AEROPLANE TESTS AT WOODBRIDGE.

Piloted by Major Brackley, the Handley Page W.8 accomplished a fine performance on the Martlesham Heath Aerodrome, near Woodbridge, on Saturday in the high speed trial of the Air Ministry Civil Aeroplane Competition for large machines, when she made a speed of 118·5 miles per hour. This is a "record" for the meeting, and beats the ... which was previously the best, by 16 miles. The Handley Page, which can carry 15 passengers ... now favourite for the Air Ministry's ... on the engine.

Deserved Success.

The Napier went through all the tests without giving the slightest trouble. ... failed to start on its own automatic starting appar... it was asked to do so, and it was never necessary to do ... as clean a plug or tighten a nut. Mr. H. T. Vane ... right to be proud of his firm's products. ...

... up by the Westland ... tests for small machines, by nearly a mile per hour. A remarkable feature of the flight was that the machine flew the one-mile speed course practically uncontrolled. This performance now gives a lead to the Handley-Page over the ... for the big money prize, as her figures in the fuel economy test are superior to her rival's.

"Figures in the fuel economy test are superior to her rivals."
Daily Telegraph, 23/8/20.

"The Napier went through all the tests without giving the slightest trouble."
Aeroplane, 25/8/20.

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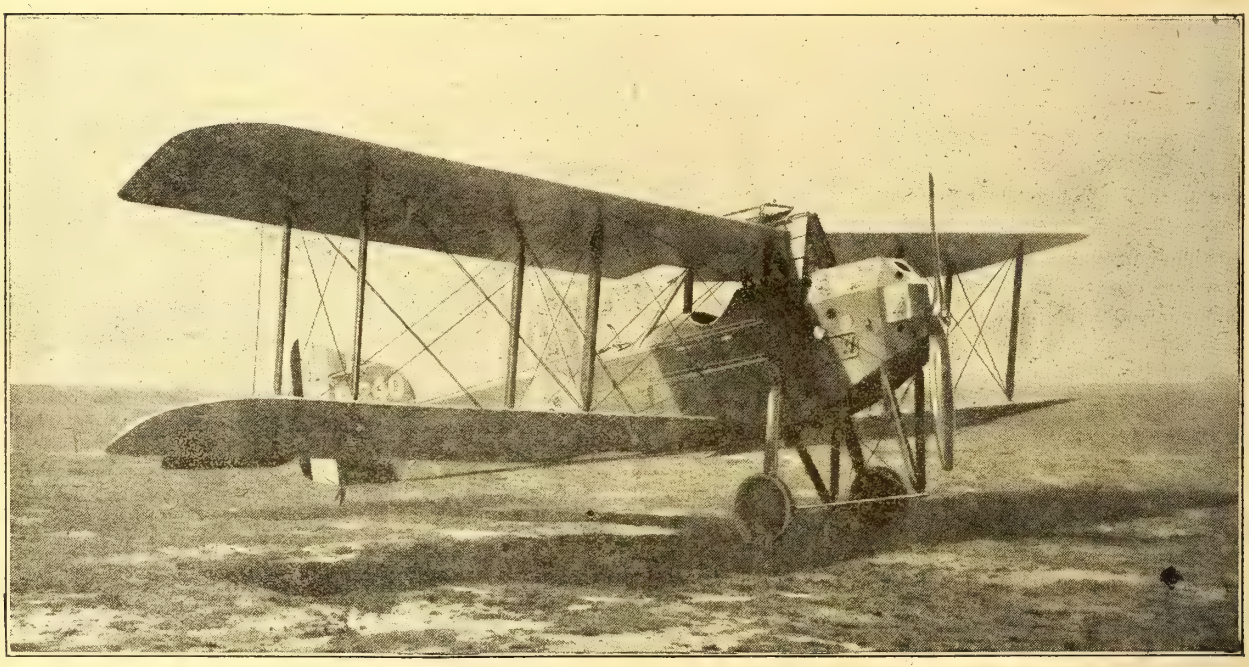

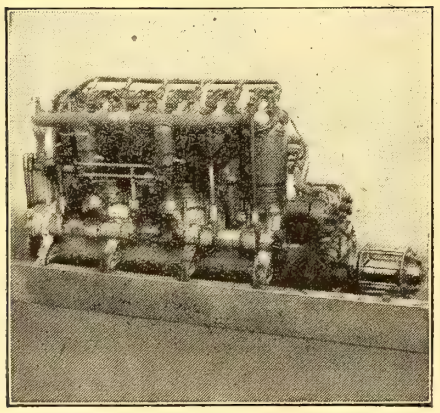

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THE WEEKLY COMMENTARY.

The Presidential Address to the Engineering Section of the British Association at their recent meeting at Cardiff, delivered by Professor C. F. Jenkin and published in abstract below, is of considerable interest to all aeronautical engineers.

Practical engineers are apt to possess an expansive contempt for the knowledge possessed by all those who are styled professors, and it is always encouraging to discover the professors confessing themselves aware of the limitations to their own knowledge.

This, unfortunately, is a confession very infrequently made by the engineer himself.

The second of the series of articles on the History of Aircraft Wireless appears in this issue and deals with the earlier period of the war.

Some hitherto undescribed D.F.W. aircraft are illustrated and commented upon by Mr. Hildesheim in the pages which follow.

A note on China as a market for British aircraft appears on page 492, and should be of interest to all who desire to sell aircraft.

ENGINEERING MATERIALS IN THE LIGHT OF AIRCRAFT EXPERIENCE.

The presidential address to the Engineering Section of the British Association meeting at Cardiff, delivered by Professor C. F. Jenkin, and dealing with "The Strength and Suitability of Engineering Materials," is of particular interest to aeronautical engineers in view of Professor Jenkin's work on the strength of aircraft materials during the war, and because in its matter it is entirely based on the results of aircraft experience.

In opening his address Professor Jenkin said—

"It has been very remarkable how again and again in aeroplane engineering the problems to be solved have raised fundamental questions on the strength and properties of materials which had never been adequately solved. Some of these problems related to what may be termed theory, and some related to the physical properties of materials."

THE STRENGTH OF TIMBER.

Dealing first with timber—one of the oldest of constructional materials and of prime importance in aeronautical work, Professor Jenkin points out that it is "anisotropric," and that the grain may be used to locate three principal axes—along the grain, radially across the grain, and tangentially across the grain—and that its strength along these axes varies enormously.

Engineering strength calculations are all based on the assumption of a uniform material, having a uniform strength along any axis, and there is no theory in a form available for engineering calculations which deals accurately with such a material as timber.

No ordinary engineering formulæ will give reliable figures for the strength of timber members wherein the grain is oblique, and as trees never grow straight, the grain invariably is oblique in some part or another, to some extent.

Theory would indicate that if a stress is applied obliquely across the grain of timber, failure will occur as soon as any one of the components of that stress resolved along the three principal axes exceeds the strength along that axis. This is confirmed by experiment, with the exception that for very small degrees of obliquity the decrease in strength is considerably greater than the theory would indicate.

PLYWOOD DIFFICULTIES.

Another example is that of the strength of plywood, wherein, owing to the crossing of the grain in the component sheets, the strength is roughly the same along and across the plank. But owing to the fact that the trunks from which the veneer sheets are cut taper, the grain is usually oblique through the sheet, and it results that one cannot rely on plywood having more than half the strength it should have were this obliquity not present.

Professor Jenkin suggests, therefore, that plywood can be increased in strength to a very considerable extent by splitting off the veneer, following the grain, instead of slicing it off.

As an example of the difficulties encountered in estimating the strength of some timber, "Poon," a curious Indian timber, was instanced. This grows in alternate spiral layers, forming a kind of natural plywood. In large pieces it is strong, but no method is available for computing its strength in small pieces, and presumably time lacked to carry out tests under all the various grain arrangements possible. Hence it had to be rejected as an aeroplane timber.

STEEL.

Leaving timber, and coming to steel, the lecturer said that the obvious question for the engineer was, "What is its strength?" The usual tests gave the ultimate strength, yield point, elastic limit, elongation, and perhaps the Izod and Brinnel figures. On which of these figures is the dimension of an engine part to be based?

A CONFESSSION OF IGNORANCE.

If the question is honestly faced, it must be confessed that there is no known connection between test results and the stress that steel can safely be called on to bear. The only connecting link is that cloak for our ignorance—the factor of safety.

Professor Jenkin felt confident that the only reliable property on which to base the strength of an engine part was the suitable fatigue limit, which we are not yet in a position to specify. A considerable number of tests showed that in a wide range of steels—subject to certain unexplained exceptions—the fatigue limit for equal and opposite alternations of stress was a little under one-half the ultimate strength. Thus the ultimate strength with a fatigue factor of a little over two might eventually replace elastic limits and yield points with a factor of ignorance.

The two most urgent and important questions met with in aircraft work during the war were: "Why did some part break?" and "What is the best material to use for a part?" It was disconcerting to discover how inadequate was one's knowledge to answer these simple questions.

The general answers were: "It broke because it was too weak—make it stronger," and "General practice indicates such a material as the best; better not try any other or you may have trouble."

In aircraft weight was paramount, to make a part stronger —i.e., heavier—was a confession of failure.

General practice was no guide to aero engines, which were built of the strangest materials.

A PUZZLING CASE.

As an example, he instanced a broken airscrew shaft. It had failed with a beautiful spiral fracture. What was the stress which caused it? He had failed to explain it by any of the facts he knew about the steel it was made of.

It was a fatigue failure, it had spread gradually, but did it fail under tension, bending or torsion? And why was a spiral direction followed by the fracture?

Until the nature of the stress was known it was impossible to indicate the nature of the load which caused it, and therefore one could not guard against it.

50- Versus 100-ton Steel.

As to choice of materials, he instanced the case of engine crankshafts. Late in the war there was a difficulty in obtaining the high grade nickel chrome forgings then in general use, and proposals were made to use a plain carbon steel. A conference of distinguished engineers and metallurgists was called to discuss the question, and no one present would venture to predict whether the weaker material would answer or not, or whether the dimensions would have to be increased.

It was pointed out that a certain French engine was using 50-ton steel for crankshafts, with better results than those given by the 100-ton steel for which it was designed, altho no change had been made in the dimensions—but no one could explain why.

As another example, he asked why were oxygen cylinders annealed repeatedly? Annealing reduced the steel to its weakest condition, and he believed that the fondness for annealing was due to ignorance of the qualities required. The engineer feared brittleness and believed that annealing reduced brittleness, so he annealed blindly. We do not know what brittleness is, cannot define it, and cannot measure it —though there are endless empirical methods to detect it. Till we know what brittleness is and can measure it we were in a miserable condition.

During the war he was consulted as to reducing the weight of oxygen cylinders, and advised trying the high grade alloyed tubes used for aircraft. The department concerned tried the experiment, and it was, he believed, a success.

But it was only a lucky guess on his part, and no means was known of determining the suitability of the material accurately, so they were only accepted after a number of empirical tests of rough usage to see whether they would burst or crack.

Surely an engineer should be able to say whether a cylinder is safe without dropping it from the roof or rolling it down the front door steps to see if it breaks.

The difficulties were bad enough when dealing with steel alone, but when it was a question of replacing steel by some other alloy they were even worse.

A Fundamental Question.

The suitability of different materials presumably depended on their fundamental physical qualities. These may be many, but some physicists think they are but few and, knowing these few, it may be possible to deduce all the complex qualities required by the engineer. This is the most fundamental problem which needs solution to enable the knowledge of the strength of materials to be placed on a sound basis, and will need the co-operation of able physicists, metallurgists and engineers to solve it.

Engineers are intensely practical men, and their practice was generally ahead of their theory. They had seldom time or opportunity to solve general problems, and therefore they were used to making their experiments models of the real thing. The results so obtained were directly applicable to the particular problem, but of little general use, as they depended on too many factors.

He advocated researches of a diametrically opposite nature, absolutely general, with the results depending on one factor alone at a time, so that general laws applicable to all special problems might be established

THE HISTORY OF THE DEVELOPMENT OF AIRCRAFT WIRELESS.

II.—The Early Period of the War.

So far as concerns the influence of external noises on the reception of wireless signals in aircraft, at no time during the development of aerial radio-communication did this factor assume such importance as has been generally ascribed to it. A much more frequent source of trouble lay in the effect of the engine vibrations on the adjustment of sensitive instruments.

The noise of the engine, which is always more or less effectively excluded by the use of close-fitting telephones and helmets, is, at its worst, but a dull, persistent, deep-toned roar through which the comparatively high, staccato notes of a wireless signal can be easily detected. A sudden change in the pitch of the engine note usually results in a momentary reduction in the powers of hearing, which, however, soon return to normal when the ear becomes accustomed to the new sound.

Vibrations and Receivers.

The excessive vibrations transmitted throughout the machine by the engine always presented a much more formidable difficulty to be overcome in connection with receiving instruments for aircraft. The real trouble lay in the possibility of the ideal contact point on the crystal being disturbed by the engine vibrations, and special efforts were devoted to devising a suitable and reliable means of eliminating this trouble. Numerous methods of elastic and spring suspension were tried, with varying degrees of success, and so obstinate did the problem become that, for a time, the most satisfactory way of combating it involved the hanging of the receiver in an elastic sling round the operator's neck.

Reinforcing Received Signals.

As stated in the previous article, even the best reception conditions did not yield satisfactory results when working with an ordinary crystal detector, and, from the outset, it was necessary to employ some means of strengthening the sound of received signals. The instrument used for this purpose was known as "the Brown Telephone Relay." This piece of apparatus, which in its original form was not specially designed for aircraft use, was adapted to existing requirements with very satisfactory results.

No doubt there are many war-time observers who can recall long and tedious struggles with the Brown Relay owing to the delicacy of its operation and the rather complicated commutator switch which was part of its equipment. In spite of this, it will never be forgotten that during the earlier years of the war it served a great purpose, and contributed more than any other individual instrument to the solution of the problems of aircraft reception.

The Brown Relay.

Fig. 1 shows the actual form of the Brown Relay, whilst Fig. 2 gives a diagrammatic representation of its various parts. Referring to Fig. 2, E and L are the points at which contact is made between the Relay and the crystal receiver. N and S are the laminated pole pieces of a permanent magnet on which are wound two coils (H) of fine wire. A steel reed (P) is fitted

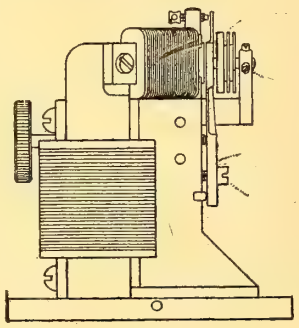

Fig. 1.

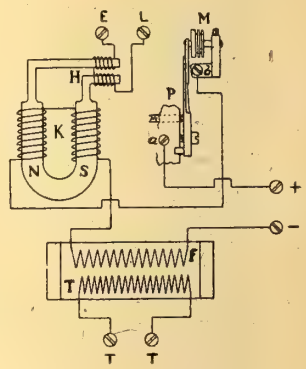

Fig. 2.

in front of these poles in such a way that it can vibrate slightly towards, or away from, the magnet. By means of an adjusting screw at the base of this reed, it is held in such a "critical" position that, *before the entrance of wireless signals*, the pull or attracting force of the magnet is exactly balanced by the spring of the reed.

The top of the reed carries a carbon disc mounted on the mica diaphragm of the microphone. The outer edge of the mica is clamped by a screwed ring on to the body of the microphone cell, the stem of which is fastened to an insulated support. The cell contains a second carbon disc inside, and the space between is nearly filled with fine granules of carbon. A regulating winding (K) is wound round the limbs of the permanent magnet in order to prevent any serious drop in current when the Relay is strongly operated. This is placed in series with the primary winding (F) of a transformer and a six-volt battery—all being connected across the microphone as shown in Fig. 2. The following is a brief account of how this instrument functions :—

The Mode of Operation.

The incoming signals, which are applied to the terminals L and E, flow through the winding H and increase or diminish the pull of the magnet according to their direction. The effect of this is to decrease or increase the pressure of the reed on the microphone, thus causing corresponding variations in the electrical resistance of the carbon granules. A steady current of about 30 milli-amperes is constantly flowing through the microphone circuit, and each time the resistance of the microphone is varied (which is brought about by the passage of the minutest current through the coils H) a comparatively large alteration in current is effected in the local circuit. This larger current, in flowing through the primary transformer winding, is induced into the secondary (T), from which it is conveyed through the terminals TT into the telephones, and thus produces a good loud signal. A further

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amplification of signal strength was obtained by using two Relays in tandem, as in the case of the special instrument designed for aircraft.

The commonest source of trouble with the Brown Relay lay in the extreme sensitivity of the reed adjustment. The slightest jar or shock was sufficient to cause that ominous "click" in the telephones which was as effective in terminating reception as if a coal hammer had forced an entrance through the lid of the receiver. In order to eliminate the vibration effect as much as possible, the Relays were usually slung by thin elastic bands in the tail of the machine. This practice, of course, possessed the disadvantage that no adjustment could be effected during flight.

Official Indifference.

On the outbreak of war, the number of machines of any kind fitted with wireless could probably be counted on the fingers of one hand. Such useful work was done by the assistance of existing wireless apparatus on airship patrol during the autumn of 1914, that the hopeless inadequacy of our equipment—both in instruments and trained personnel—was speedily realised and fought against by practical airmen. The "higher authorities," however, declined to budge from their habitual attitude of indifference, and continued to withhold the financial assistance which the situation demanded.

At this time the chief centres of aircraft wireless were at Eastchurch and Farnborough, and at both these stations the industrious pioneers of aircraft wireless applied themselves to the task of evolving an efficient transmitter and receiver for use in machines.

The First Satisfactory Receiver.

The first receiver design to give satisfaction was known as the type Ta, with a carborundum crystal and potentiometer. This instrument was used in conjunction with the tandem equipment of Brown Relays, and yielded fairly satisfactory results. In the summer of 1915 three new forms of crystal receivers were produced, and were known respectively as the Tb, Tc, and Td. Each gave quite good results and was used for a considerable period during the first years of the war.

As space forbids the individual treatment of these instruments, it will be advisable to consider the construction of the most recent one in brief detail. The Td (see Fig. 3), which weighed only 5 lb., was the last crystal receiver to be designed for use in aircraft, being eventually superseded by valve instruments, which will be dealt with in a later article. The design of this receiver was compact and of convenient shape, being enclosed in a narrow oblong box with an ebonite face. The component parts comprise the following :—

- Aerial condenser.
- Aerial tuning coil (primary).
- Aerial coupling coil.
- Secondary tuning coil.
- Secondary condenser.
- Reversible carborundum detector, and potentiometer.
- Testing buzzer equipment.

The aerial condenser, which is of the fixed-vane type, is situated within the aerial tuning coil, and possesses a capacity 0.36 jars. As the function of the condenser is to reduce the natural wave-length of the aerial when receiving short waves, a short-circuit switch is provided by which the condenser can be cut out or inserted as required.

The aerial tuning coil has an inductance of 356 mics and, with a 200-ft. aerial, is capable of tuning the aerial circuit to receive a wave of 2,300 ft.

The aerial coupling coil is a small inductance of 14 mics, and the secondary tuning coil, which is wound on an ebonite reel outside the secondary condenser, has a total value of 150 mics. The secondary condenser, whose capacity can be varied within the limits of 0.0426 and 0.44 jars, is of the movable vane type with air dielectric.

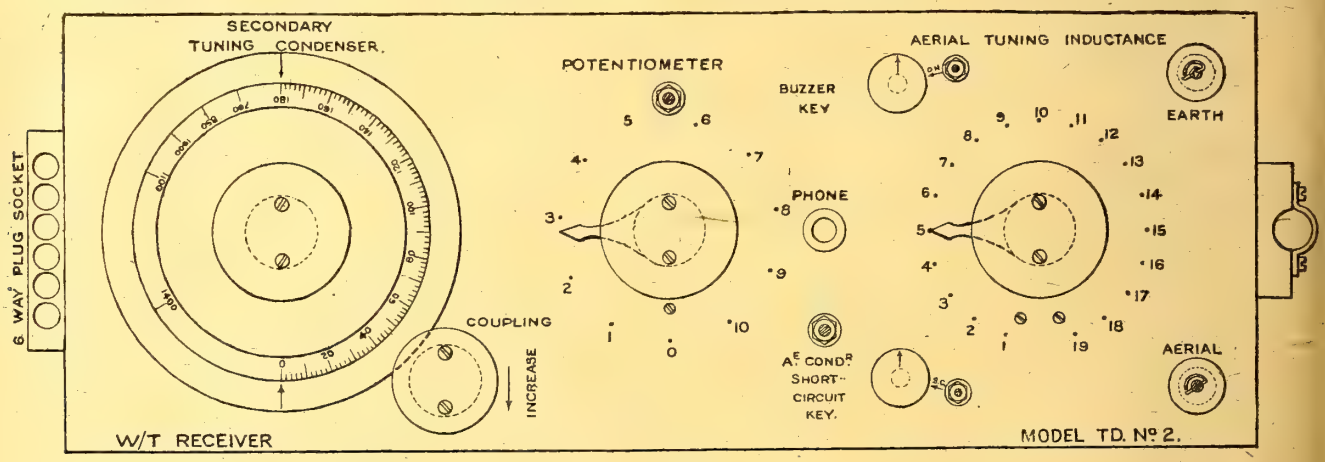
For convenience of operating, the values of adjustment for wave-lengths of 700, 850, 1,000, 1,100, and 1,400 feet are marked on the dial.

A carborundum crystal, which necessitates the use of a potentiometer and battery, is mounted on an ebonite base in such a manner as to permit of the crystal being changed when necessary. This particular form of crystal is favoured because, although involving the use of potentiometer equipment, its peculiar durability permits of a good firm contact and thus reduces the probability of trouble due to vibration.

A novel feature of this instrument is the spring telephone plug which, on insertion or withdrawal, automatically throws in or out of circuit the Relay and potentiometer batteries. As this plug was permanently attached to the telephone leads in the operator's head-gear, it ensured that the operator could not "forget" to switch off the batteries on leaving the machine.

Transmitter Progress.

Whilst all this excellent work was going on in connection



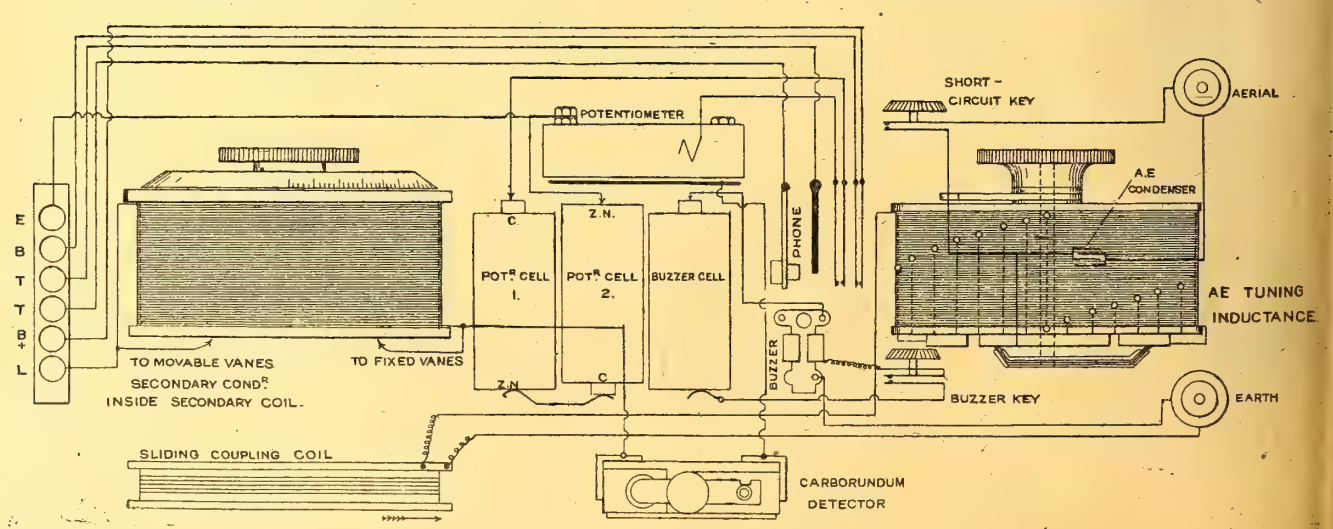


Fig. 3.

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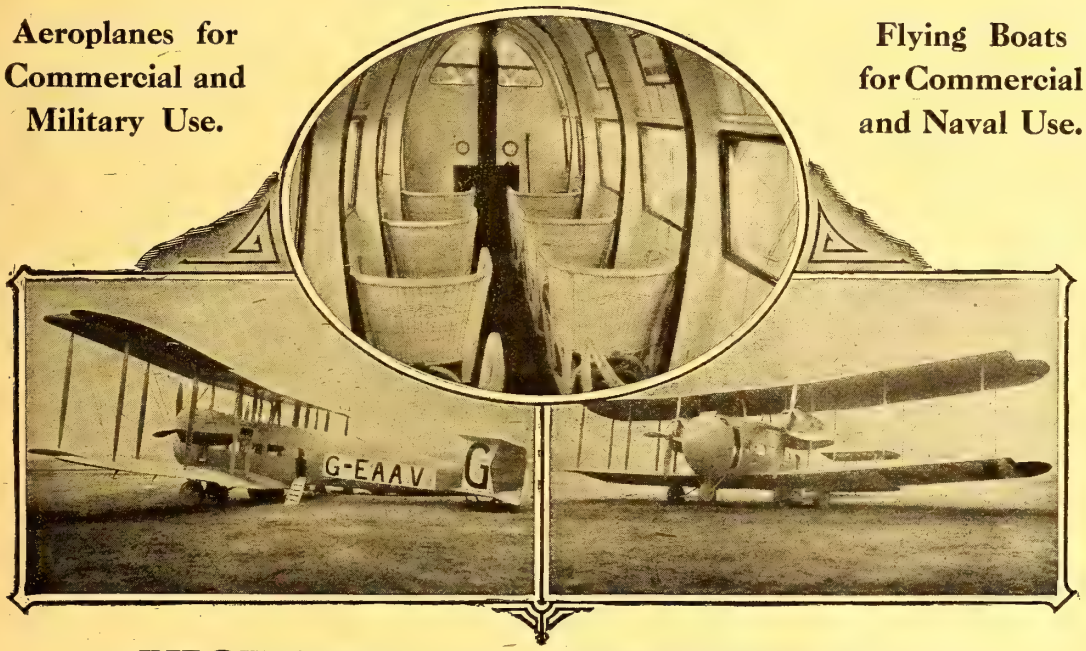

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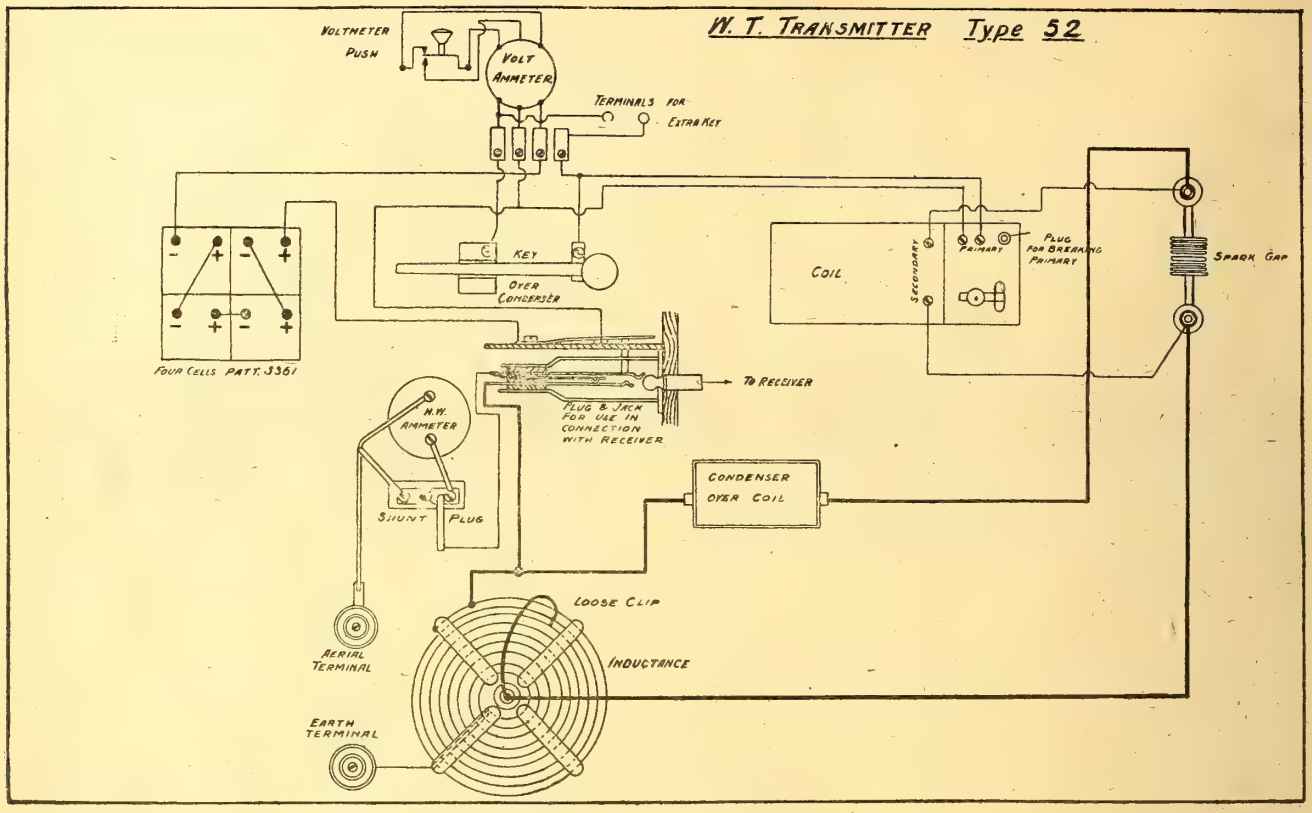


Fig. 4.—The Sterling Transmitter.

with aircraft reception, equally strenuous efforts were being made to evolve a transmitter which combined the requisite proportions of efficiency, lightness, and smallness. Towards the end of the first year of war a transmitter was constructed which, although destined to be swiftly superseded by improved forms of its own design, represented a considerable advance in the right direction.

This instrument was the "Sterling" transmitter—officially designated the T52. This is a very compact fixed-spark transmitter which derives its power from an eight-volt accumulator, or, in later models, from four pattern 3361 cells. Although this use of batteries possessed the advantage of dispensing with any form of mechanically-driven power generator, it also constituted an item of equipment which demanded the closest attention. Careless charging, dirty terminals, over-discharging, etc., were common causes of trouble.

A Dubilier type condenser is used in this transmitter, which is built on the induction coil principle with a vibrating armature. The adjustment of the spark length is effected by means of an ebonite handle which protrudes from the side of the transmitter case, and two gauze windows are provided to ensure suitable ventilation. Fig. 4 is a diagram of connections of the T52.

Although good results were obtained from this transmitter on various wave lengths, it was found in practice that the distances obtained usually varied directly with the tightness of the coupling. Consequently the longest waves obtained the longest ranges.

A telephone plug and socket was employed by means of which the receiver is brought into circuit, the necessary connections to aerial and earth and the severing of the battery circuit being simultaneously effected by the insertion of the plug. Under good working conditions a normal range of 35 miles was obtained with this transmitter.

Further Progress.

Although, as previously stated, the advent of the "Sterling" transmitter represented a considerable step in the right direction and, in conjunction with the Ta receiver, rendered invaluable assistance to the excellent work carried out by the "Blymp" Patrol towards the end of 1915, it nevertheless displayed many serious imperfections. During its first trials, wider facilities for experiment and research were being developed gradually at the comparatively few centres available for the purpose throughout the country, and, in fairly rapid succession, two satisfactory transmitters were evolved for practical work.

These instruments, which were termed the 54a and 54b, were employed with good results for a short period. At about this time also, a new aircraft transmitter was produced by the Marconi Company which resembled the "Sterling" in design, and derived its energy from an external 100-watt battery. This instrument was known as the 52b, and yielded much more efficient results than the "Sterling." A 700-watt set was also submitted for trial.

The Beginnings of Wireless Telephony and Direction Finding.

Meantime, considerable progress was being made in adapting the principles of wireless telephony to the purposes of aerial communication, and periodical reports were forthcoming of the excellent results achieved by the small band of enthusiastic investigators who were devoting their energies to this important work. Concurrently with this advance in the development of wireless telephony, the use of "direction-finding" wireless was rapidly gaining wider application in the sphere of aeronautics.

Before the end of December, 1915, a number of D.F. stations had been erected at various points on or near the coast which rendered inestimable assistance in enabling the airships on patrol to ascertain their correct position at any time of the day or night. These stations operated in groups, three stations being allotted for the supervision of a particular area.

In each group, one station—the "Control" Station—was equipped with transmitting apparatus and was in direct land-line communication with the other two. All three stations took a bearing of the signals of the craft whose position was desired; these were then plotted on special charts, and the result—i.e., the actual position of the transmitting craft—communicated immediately by the Control station.

The degree of progress effected in these two new branches of aircraft wireless was, of course, directly due to the valuable research work that had been conducted in connection with the development of the "thermionic valve," which will be dealt with in the succeeding article.

ITALIAN NOTES.

A Giant Seaplane.

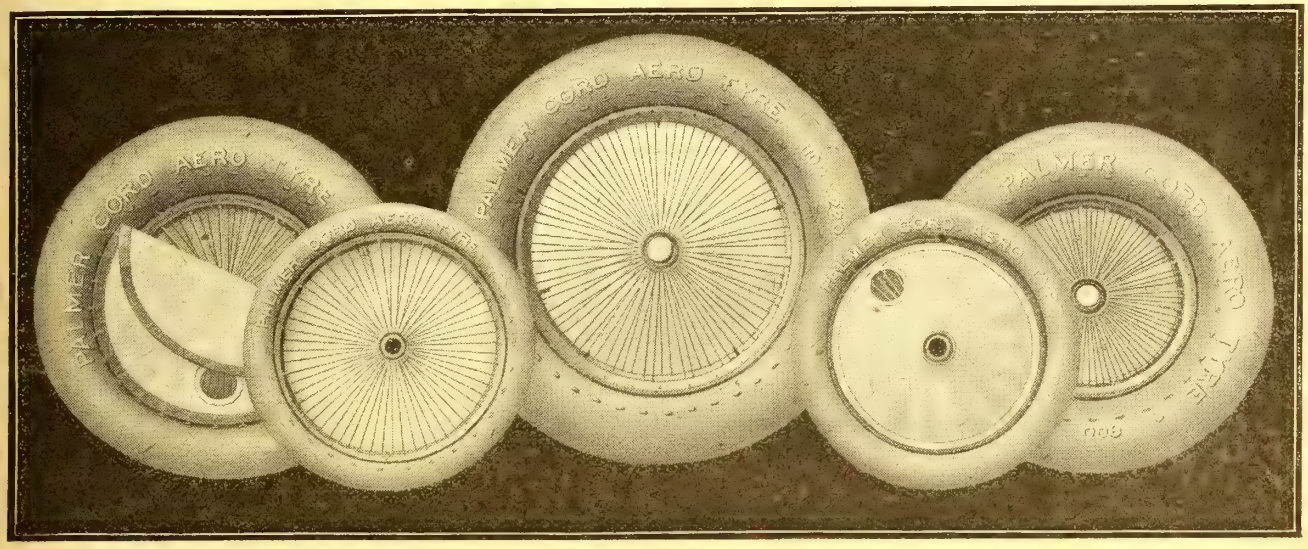
Various writers for considerable time have been circulating reports and rumours of a "giant" transport seaplane which has been built at Rome. I believe the origin of all the talk is the Pegna seaplane, a 1,000-h.p. flying boat powered with four I.F. engines, now said to be preparing for flight at Ostia, on the coast near Rome. The connection of its designer with the higher ranks and inner circles of Naval activity has, so far, prevented him talking and others inquiring further. The vision of big pluri-motored seaplanes is ever present with Italian designers nowadays.

The Ansaldo Engine.

One continues to hear golden reports of the Ansaldo 480 E.28 motor. If no further postponement of the Schneider Cup occurs, its performance on Sept. 20th will be worth watching closely.—T. S. H.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132 46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135 50
,,	*40	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

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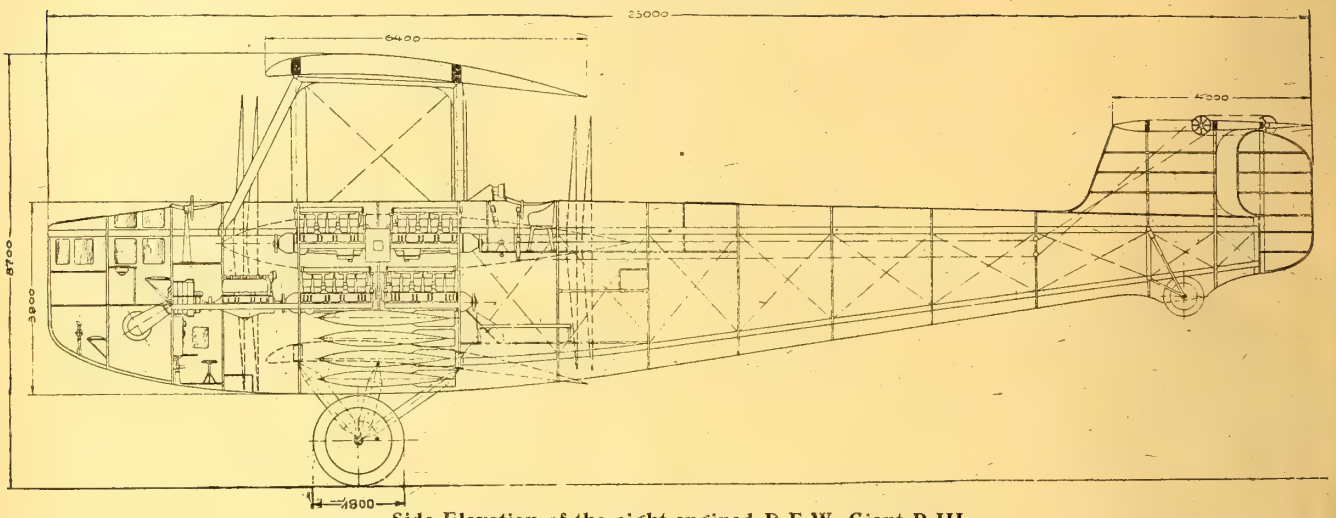
LIDINE.

RECENT D.F.W. AEROPLANES.

By ERIK HILDESHEIM.



Side Elevation of the eight-engined D.F.W. Giant R.III.

The D.F.W. Company at Leipzig was during the war one of the chief suppliers of two-seater biplanes of the C class to the German army, but had also taken up the production of giant aeroplanes at official request in 1914. A type of their own was turned out with a four-engine central power plant, each engine driving its own propeller through a transmission shaft. These giant biplanes were used on active service mainly on the Russian Front, and at the time of the Armistice this type was about to pass to a second stage of development, as the designs had been completed for an enlarged edition to be driven by eight engines of 270 h.p. each.

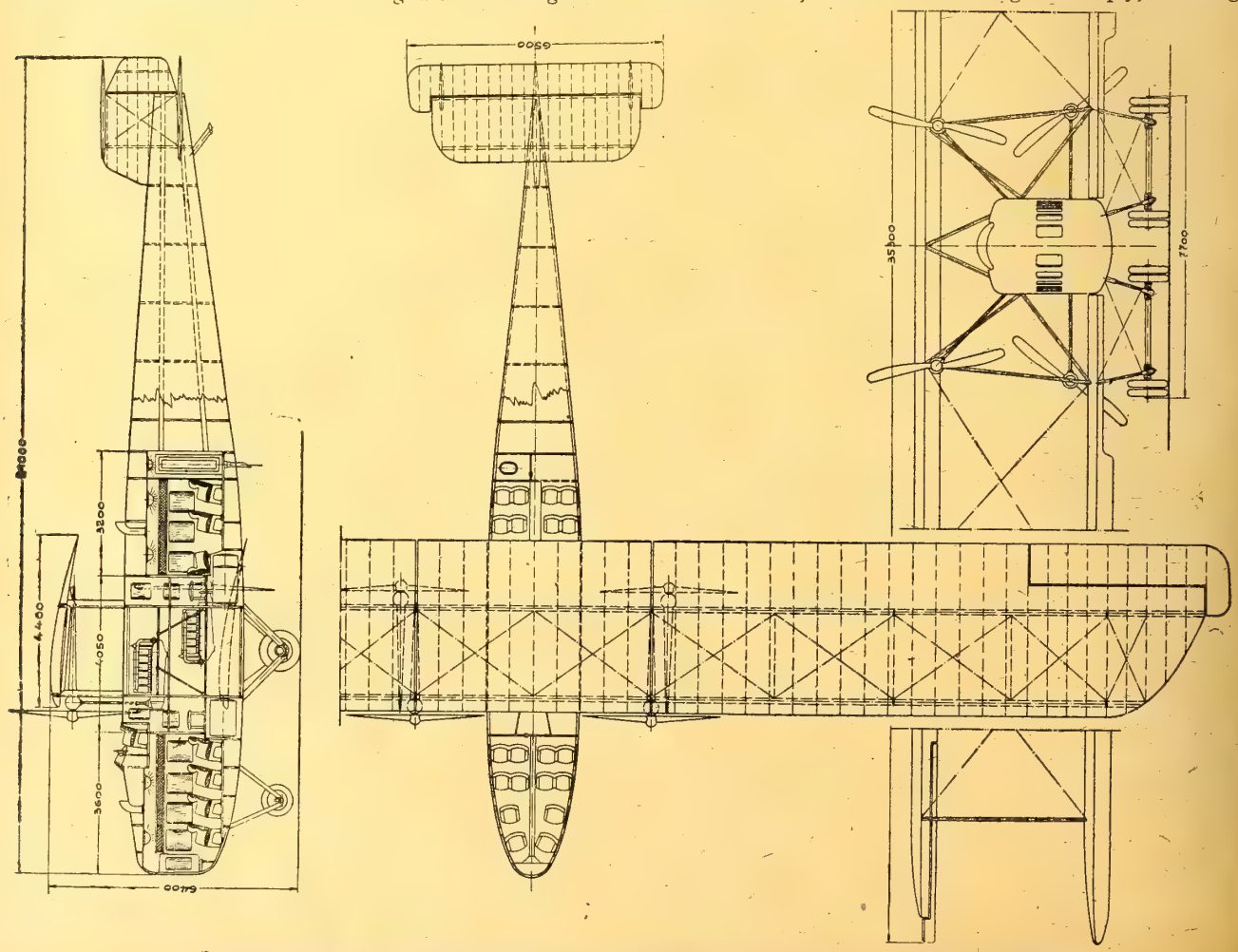
The plans of the 2,160-h.p. multiple-engined D.F.W. giant, which did not get beyond the drawing-office, are reproduced. The arrangement of the eight 270-h.p. engines is evident and apparently they drive each their own screw. A ninth engine, a 110-h.p. Mercédès, drives apparently a supercharger and it is said is also used for starting the main engines. The bombs of a total load of 2.5 tons are stored below the engines.

Contrary to the biplane tail practice of the D.F.W. R.II model, a monoplane tail is employed here. The neat encowling of the auxiliary landing wheel is noteworthy. The cubic capacity of the body has increased sufficiently to afford sleeping-berths, cabins, and a lavatory for the crew, as well as the usual pilot positions arranged below the trailing edge of the planes. Apparently a forward control station fitted with a steering control is also fitted. A wireless compartment will also be found.

A Converted Giant.

A commercial specimen of the original giant was started upon after the Armistice, of whose activities nothing has been heard so far.

As in all the D.F.W. aircraft the body of the civil R.II type is made of wood, coated with water-tight three-ply, resulting



General arrangement of the Commercial Version of the D.F.W. type R.II Giant Aeroplane.

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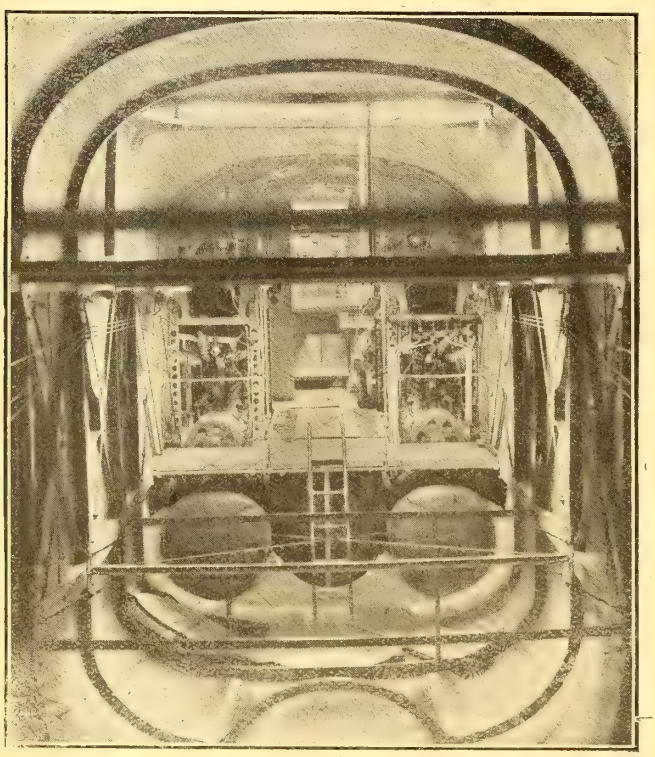
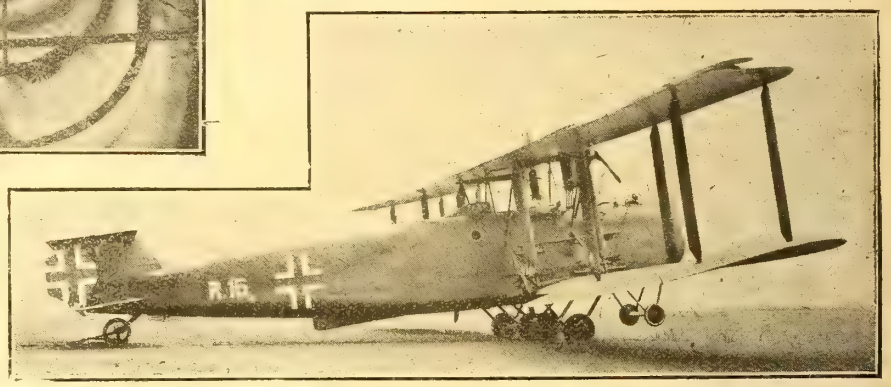




THE D.F.W. R.II GIANT.—Above, a view in the fuselage showing the engine installation, with the fuel tanks below. Alongside, a general view of the original bomber type showing the curious position of the four airscrews

in great strength. Special tube struts, with crossed cable bracings, are also provided, and the floor is made part of the structure.

Special attention has been paid to the engine installation, as the four 260-h.p. motors are enclosed in a pressed steel housing, to which the wings and the landing gear are attached. Including the inner interplane struts and the propeller gear supports, this rigid construction makes for safe operation of the engine transmission. The engine and propeller shafts are parallel, and the reduction ratio of the bevel gears is 7 to 14, i.e., 1,400 engine r.p.m. and 700 screw revs.

Passenger cabins are arranged both in front of and behind the central engine-room, each having seating accommodation for 12 passengers. Above the front passenger cabin the pilot's cockpit is provided.

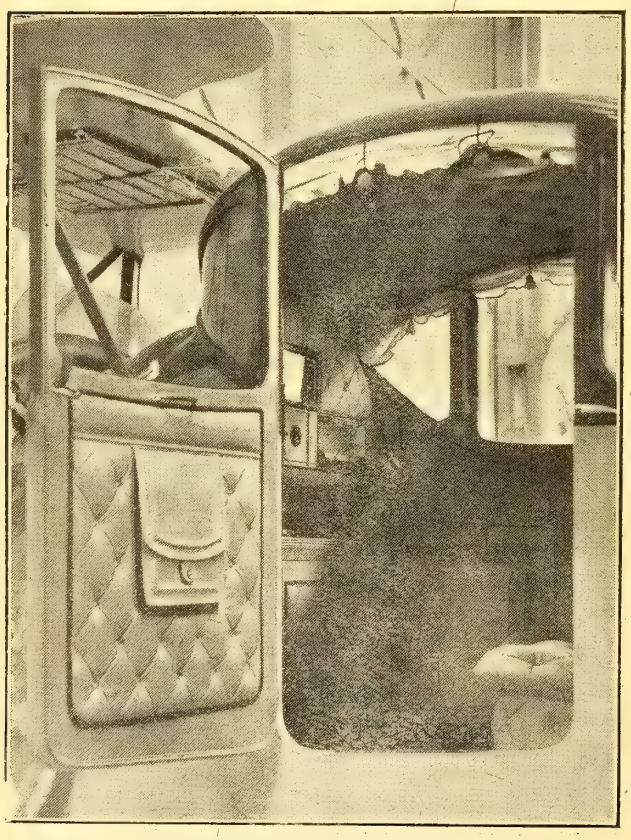
Ample sanitary, storage and safety appliances are fitted, the mail compartment is roomy, and fire extinguishers are arranged at various places.

The special D.F.W. arrangement of the four screws on two levels, two of them below the leading edge of the top planes, and two at the trailing edge of the bottom ones, is used with the object of all working in fresh air in spite of the tandem lay-out. Having to sustain high pressures the gears and bearings are fitted with a thermo-electric indicator, registering to the engineer and the commander.

Each motor has its own oil tank, mounted directly on the magneto side. The petrol tanks, numbering 7, each of 350 litres capacity, rest in frames on the fuselage struts below the motors.

The planes follow almost the form in the D.F.W. two-seater, the top ones are divided into a centre section and two side parts, the bottom wings consist of two parts, the inner ones of which run to the joints of the landing gear and airscrew support struts. All the interplane wiring is of double cables.

The tail fin is made in one piece with the fuselage. The elevators are provided with ball-bearings.



The Cabin of the D.F.W. C.V. Limousine.

Other Peace-Time Activities.

Some altitude flights close to the world's records of the time were during 1919 put up by a D.F.W. type 37 III, which had been completed at the time of the Armistice, and had the standard 230-h.p. Benz engine changed for a 185-h.p. B.M.W. of the altitude type.

Also the C.V model has been converted to a limousine, with enclosed cabin, and was shown in Holland by a flight to Amsterdam at the time of the Elta Exhibition.

The enclosed passenger cabin, with side entrance door, where the observer was formerly to be found, has staggered seats for two persons in a sloping arrangement, with a table in front of the right one. The interior view affords the impression of the usual equipment to be found in a car limousine.

The specification of the C.V modified for commercial purposes is as follows :—

Span overall	10 m.	Empty weight	1,040 kg.
Chord	1.7 m.	Total load	480 kg.
Gap	1.8 m.	Permissible excess load	80 kg.
Overall length	7 m.	Max. flying weight	1,600 kg.
Height	3 m.		
Span of tail	32 m.		
Motor	230-h.p. Benz		

Late War Machines.

The specifications of two of the latest war type D.F.W. which have not previously been published are also appended.

Type	D.F.W.37 III.	Beam of fuselage	0.85 m.
Model	Two-seater reconnaissance.	Maximum height	3.252 m.
Completed	Oct. 15th, 1918.	Undercarriage track	1.8 m.
Span, top	13.6 m.	Area of planes	39 sq. m.
Span, lower	12.5 m.	Area of tail plane	1.64 sq. m.
Chord, top	1.7 m.	Area of tail fin	0.64 sq. m.
Chord, lower	1.55 m.	Area of elevator	1.68 sq. m.
Gap	1.6 m.	Area of rudder	0.72 sq. m.
Stagger	0.55 m.	Ailerons, length	2.7 m.
Overall length	6.2 m.	Ailerons, chord	0.5 m.
		Ailerons, area	1.4 sq. m.

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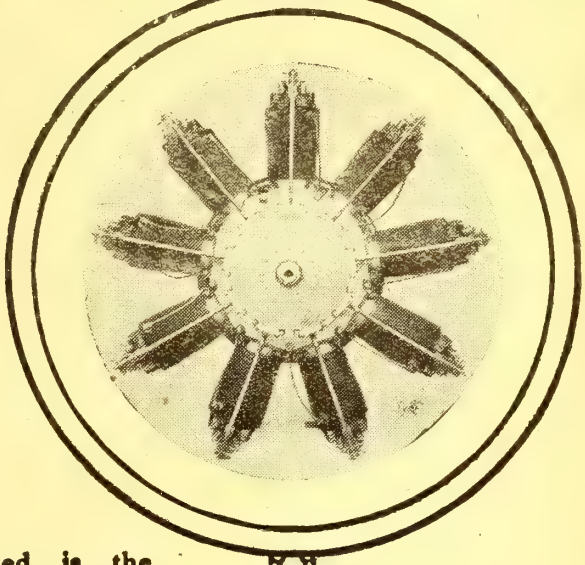

The Engine illustrated is the DRAGONFLY—340 h.p.—9 cyl. (Static Radial).

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Airscrew, pitch .....1.95 m.
Airscrew, r.p.m. 1,400
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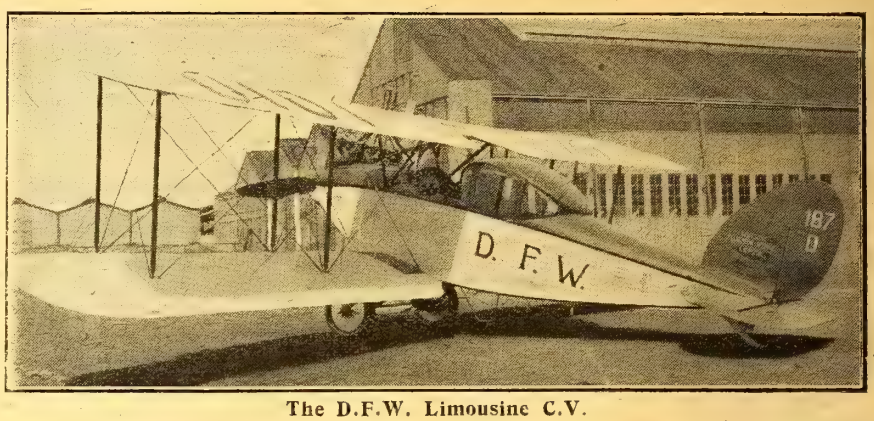
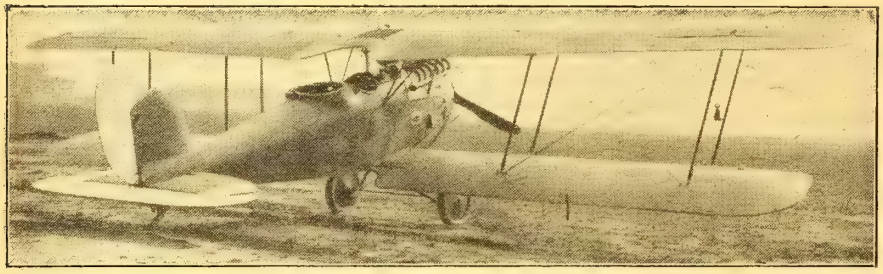
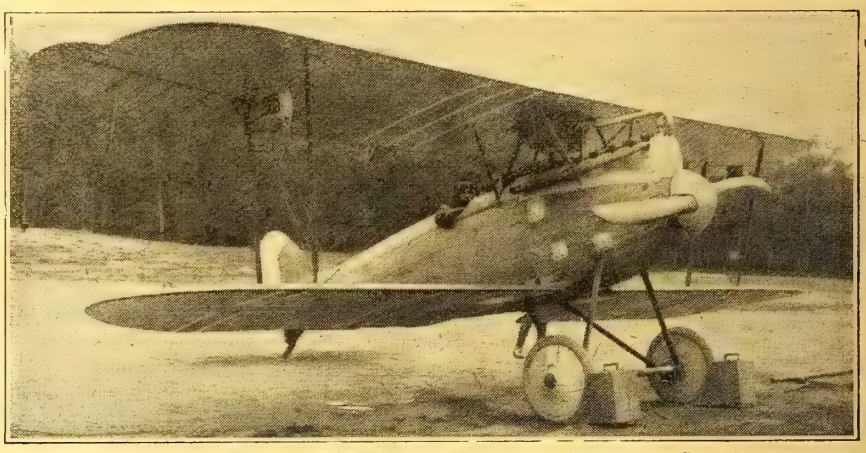
Tank capacity ..... 245 litres.
Machine gun, fixed 1
Machine gun, swivelling 1
Speed .....160 k.p.h.
Climb—
To 1,000 m. ..... 3 min.
To 2,000 m. ..... 7 min.
To 3,000 m. .....12 min.
To 4,000 m. .....17 min.
To 5,000 m. .....22 min.
Ceiling .....7,700 m.



The D.F.W. Limousine C.V.


The Two-Seater Type 37 III D.F.W.

Type .....D.F.W.34 III.
Model .....Single-seater fighter.
Completed .....April 25th, 1918.
Span, top .....9.08 m.
Span, lower .....8.5 m.
Chord, top .....1.6 m.
Chord, lower .....1.4 m.
Gap .....1.5 m.
Stagger .....0.5 m.
Overall length .....5.5 m.
Height of fuselage.....1.15 m.
Beam of fuselage .....0.75 m.
Undercarriage track .....1.7 m.
Area of planes.....23 sq. m.
Area of tail plane .....1.09 sq. m.
Area of tail fin .....0.4 sq. m.
Area of elevator .....1.16 sq. m.
Area of rudder .....0.63 sq. m.
Ailerons, length .....1.8 m.
Ailerons, chord .....0.35 m.
Ailerons, area .....1.96 sq. m.
Area load .....36 kg./sq. m.
Engine .....160-h.p. Mercédès.
Engine installation weight.....290 kg.
Airscrew, diameter .....2.76 m.
Airscrew, pitch .....2 m.
Airscrew, r.p.m. 1,400
Tank capacity .....80 kg.
Tank capacity .....50 litres.
Machine guns, fixed 2
Speed .....177 k.p.h.
Climb—
To 1,000 m. ..... 2 min.
To 2,000 m. ..... 4 min.
To 3,000 m. ..... 9 min.
To 4,000 m. .....14 min.
To 5,000 m. .....20 min.


The D.F.W. Type 34 III Single-Seater.

A USEFUL VOLUME.

The Aeroplane Handbook. Edited by Capt. A. J. Swinton, F.R.G.S., F.R.C.I. (London: The Aeroplane and General Publishing Company, Ltd. Price 21s. net.)

With the art of aeronautical engineering in its present state, the temptation to authors and editors to attempt the compilation of books of the reference type appears to be overwhelming. The enormous amount of information gathered and kept in various quarters during the war and now released for publication supplies the necessary material ready to hand, and compilation has no terrors save for those who have attempted it.

Nevertheless, such compilations offer serious difficulties quite apart from those of the mere laboriousness thereof. The technical expert is usually not a success as an editor, failing in that he does not adequately recognise that methods of reasoning clear to himself may be dark and obscure to equally intelligent but less habituated minds.

On the other hand the inexpert literary man finds serious difficulties in deciding upon the technical importance and the accuracy of statement of his contributors.

Capt. Swinton has fairly successfully steered his course between these difficulties and has satisfactorily collected a number of capable contributors whose pronouncements on their particular subjects may be relied upon to be instructive and informative.

In some respects the Aeroplane Handbook is unlike any other of its type. It is curiously miscellaneous, and its contents range rather spasmodically from workshop hints to fairly detailed considerations of aerodynamical theory as applied to aircraft design.

It should be possible in future editions to remedy this by mere rearrangement of the contents, and this should be done.

As the work stands it forms a collection, in a compact and handy form, of a number of useful articles dealing with various aspects of aeronautical engineering, and should be a useful addition to every aeronautical library.

A HANDY LIST.

Brown Bros., Ltd., the well-known motor accessories specialists of Great Eastern Street, London, in addition to their motor catalogue, have just produced a compendium of aircraft equipment.

This is a handsome volume, bound in blue cloth with gilt lettering. The fly leaves contain a scheme executed by Mr. Geoffry Watson, in which every possible type of commercial aircraft is incorporated.

The rest of the volume gives photographs of all the most famous aeroplanes and engines, and, of course, all conceivable accessories.

As the issue of this volume is limited, and to prevent it going to any but legitimate buyers and those specially interested, a charge of half-a-guinea is made.—G. D.

The Finest Material yet evolved for Aircraft Construction is

SAUNDER "CONSUTA"

Sewn PLYWOOD

"CONSUTA" must not be confounded with ordinary plywood —it is something infinitely superior. It is ideal for many purposes and under circumstances where ordinary plywood could not be used.

"CONSUTA," the Super-Plywood, is actually sewn together. The layers are first cemented together with waterproof material and then stitched through in parallel rows about 1¼ inches apart. This gives a rigidity and resilience unattainable by any other method. Weight for weight it is the strongest material yet evolved.

"CONSUTA" is used for the cabins of the commercial type of Vickers "VIMY" bombers, entirely dispensing with the use of cross bracing wires. It is now being used for the whole covering of flying boats — the largest type yet built. Its uses are limitless.

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Telephone: COWES 193.

THE CHINESE MARKET FOR BRITISH AIRCRAFT.

By C. Wood, Student, I.Ae.E.

The Vickers' Contract.

Undoubtedly, it is within the knowledge of the British public, especially those connected more or less with aviation or firms manufacturing aircraft, that the Chinese Government, in the year past, made a big contract with Vickers Ltd. for a number of "Vimy Commercials" to start a commercial service in the country. The machines are being shipped as they are completed from time to time. Estimated by the authorities in the Aeronautical Department, Peking, the service will likely come into being by next spring, and will go in full swing on the lines between Peking and Shanghai, Peking and Hankow, Peking and Kulgan, and Peking and Mukden. In view of the British skilful designing and careful workmanship, we shall not doubt for a moment that ardent success will be the ultimate end.

A Handley Page Contract.

The next firm that has secured an order from the Ministry of Communications at Peking is Handley Page Co., Ltd. They supplied four Handley Page O.400 types for the inauguration of a permanent aerial mail service connecting with the Chinese Post Office. From the reports at hand and opinions of the Press at Shanghai and in the capital, it is evident that they have also scored considerable success and left a mark of merit in the minds of the Chinese.

An American Company.

From some reliable source it is learned and confirmed that a company known by the name of "Chino-American Aerial Transport Co.," formed with joint capital of Chinese and Americans, has been ready to start another service linking up such cities as Shanghai, Gichang, Hankow, Chungkiang and Chengtu—the only aerial route in China possibly sure of prosperity. The cities are all situated on the banks of the famous Yangtze River and predominate a great amount of business into the interior provinces. What is more, the lack of railways and danger to sail in the river have set many business heads thinking to adopt a different form of transports.

The Advantages of Aerial Transport.

In my opinion, nothing could be better than aircraft; and aircraft alone would be the substitute, and would, in all probabilities, suit them better and best. Of course, unless they are assured of its safety, economy and comfort, the issue still hangs in balance. Then, a question will naturally rise, "How could any firm, if intending to do such a business, expect to prosper or pay should the best route have already been preoccupied?" To answer this to the general satisfaction of all I should like to point out that the trade in the world-market nowadays is not for those advantageous of an early start, but those who follow closely in competition. By competition, zenith of efficiency may be reached, and prosperity be achieved.

The "Open Door."

China, being a nation of Open Door Policy, is always open to all foreign competitions, regardless of nationalities, be they British, Americans, or any others. Only best manufactures with lowest charges could hold a market well therein. The past experiences of many a British merchant in China will doubtless ascertain its truth. The present system of aerial routes covers just a few North-Eastern provinces, while a great many provinces in the South and West badly in need of some form of better transports still remain untouched. It is, therefore, up to those with quick judgment and far sight to grasp the chance, and then success may be within their easy reach.

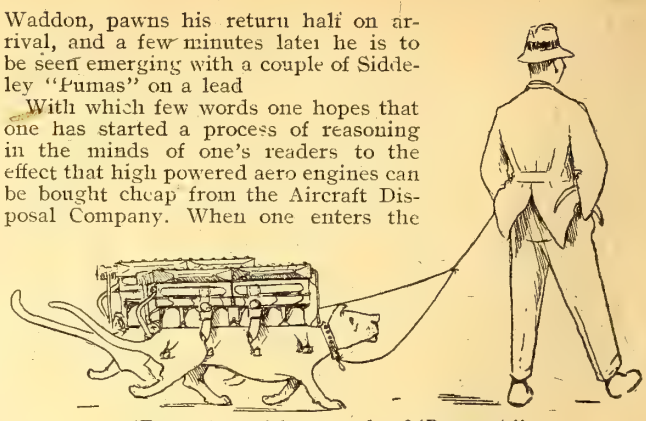
As an aeronautical student in this country, where best manufacture of aircraft in the world are to be found, I would personally advise British individuals or firms not to neglect these views merely as passing meteors.

CONCERNING SURPLUS ENGINES.

"Yes, but it's damned expensive. Why, the engine alone will cost about a thousand quid." This phrase can be heard almost anywhere at any time when people are contemplating any venture in which there is a petrol or gas engine concerned, whether it is the fitting up of a racing car, an aeroplane, a motor boat, or some domestic contrivance to amuse the baby such as a Liberty engine.

When one hears this said, after one's various visits to the storage depot of the Aircraft Disposal Company at Waddon, in which one has seen perfectly good engines sold for about "two-three a yard" one always arises and slays the objector, remarking, "You emaciated imbecile, why the hell don't you go to Waddon and buy a threepenny engine and stop talking like an Airco 6?" After which friendly opening the person in question usually buys a third-class return ticket to Waddon, pawns his return half on arrival, and a few minutes later he is to be seen emerging with a couple of Siddeley "Pumas" on a lead

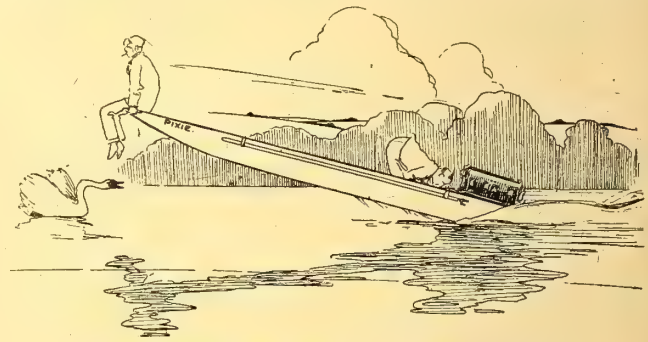
With which few words one hopes that one has started a process of reasoning in the minds of one's readers to the effect that high powered aero engines can be bought cheap from the Aircraft Disposal Company. When one enters the



"Emerging with a couple of 'Pumas.'"

engine shop one is confronted with a vista of engines in acres Rolls-Royce and Sunbeams of all shades and variations, Siddeley "Pumas," Fiats, Le Rhônes, Gnômes, Monosoupapes, Clergêts, Hispano-Suizas, Green, Curtiss, R.A.F., Wolseley, Napier-R.A.F., Bentley, Anzani, A.B.C., "Dragonfly," Liberty, and many others.

Many of the smaller engines can be used for lighting sets, and some of the larger ones for motor boats. One has seen a 160-h.p. Beardmore installed in a car with great success, but one refuses responsibility for annoyance caused if Major W—— and Capt. McA—— disturb everyone on the river on Sundays by tearing about on a punt installed with a 300-h.p Hispano-Suiza. On the other hand, if a commercial air line rush down



"Tearing about on a punt with a 300-h.p. Suiza."

and buy a cartload of these commercially sound and excellent engines one will expect a personal letter of thanks from all the directors of the Aircraft Disposal Company and a special mention in the twopennyworth of Sunday "Margot."

Seriously speaking, a visit to Waddon is well worth while to anyone, apart from those who are setting up private air forces, as there are so many really fine aero engines which may be metaphorically picked up for a song.

Besides which there are magnetos and carburetters at ridiculously low quotations, many of which could with alteration be used on cars and motor-cycles. When a magneto can be picked up for a song, one does not mind adding one or two here and there from which to run lights. Sparking-plugs can be had, too, by the thousand, and there is no more amusing pastime than to experiment on some such motor-cycle as the Douglas, in which plugs make all the difference. And here one can get plugs of all shapes and sizes for practically nothing.

The great obstacle which prevents the average human being from going into a shop and buying half a dozen 250-h.p. engines is the doubt as to whether they can get spare parts when the engine is getting old. When one has forced one's way through tons of balls and ball races and floundered among forests of gudgeon pins, pistons, cylinders, etc., for every conceivable type of aero engine, both ancient and modern, one's doubts turn into a sort of desire to see whether it will be possible to run the engine in such a way that one can "do in" these acres of spare parts before one's natural end.—G. D.

DOPE.

The representative of the Greek Naval Attaché visited the works of Cellon (Richmond), Ltd., recently to inspect large quantities of dope made for his Government. He expressed himself as highly satisfied.

SATISFACTION.

Flying Boat Co., Ltd.—Satisfaction in full on March 29th, 1920, of debentures dated Nov. 20th, 1919, securing £11,000.

Beardmore

AERIAL TRANSPORT
AS A
PAYING PROPOSITION

¶ The golden opinions held by pilots and mechanics who have handled Beardmore fitted machines bear eloquent testimony to the supreme RELIABILITY always evidenced by these famous power units.

¶ They possess those qualities that earn dividends, namely: Trouble Freedom, Low Petrol Consumption, Mechanical Simplicity and Accessibility.

¶ It is significant that so many of the Leading Aircraft Manufacturers are installing the 160 h.p. Beardmore as standard.

¶ The reason is that they of all other engines are best for the purpose.

¶ Complete engines with all spare parts despatched on 24 hours' notice being given.

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The Original NON-POISONOUS.

Titanine Dope

is strongly recommended for

PRIVATE and COMMERCIAL AEROPLANES.

Absolutely unequalled for Durability.

There is no **CONTROL** on Dope for the above types of machines.

Titanine is the most economical and offers the greatest resistance to flame.

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Messrs. Larkin-Sopwith Aviation Company of Australasia, Limited.

Melbourne Office: "Aberdeen House," 94, King Street.

Sydney Office: "London Bank Chambers," Corner of Pitt and Moore Streets.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIRMEN.

AIR MINISTRY, Sept. 1st.

EXPLANATORY STATEMENT.

1. Information relating to aerial navigation, wireless telegraphy, aerodromes and landing grounds, Customs stations, prohibited areas, and other questions of urgent and general interest, is issued, in the form of printed "Notices to Airmen," in a consecutively numbered series, by the Air Ministry when considered necessary for the benefit of Pilots and others directly interested in aviation.

2. "Notices" containing information of an urgent nature are given out in the first instance by wireless telegraphy.

3. It is important that all Pilots actually engaged in flying should make themselves acquainted with these "Notices to Airmen" as soon as they appear. Arrangements have accordingly been made for their display at terminal and Customs aerodromes at home and abroad, and for their distribution to, among others :—

The technical and daily Press.
The Aeronautical Associations and Clubs.
Licensees of permanent aerodromes.
Lloyds'.
H.B.M. Representatives abroad.

4. Copies of the "Notices" can be obtained direct from the Secretary, Air Ministry. Pilots employed by aviation firms should arrange to secure "Notices" regularly through their employers, and unattached Pilots can obtain copies through their Association or Club.

5. The latest "Notices" can also be seen at all Civil Aerodromes, and copies can be obtained personally from the C.A.T.O.'s at Croydon and Lympne.

6. When abroad the latest "Notices" can be seen at the Customs aerodrome in the country visited.

By Command of the Air Council,
W. F. NICHOLSON.

NOTICE TO AIRMEN (No. 92).

AIR MINISTRY, Sept. 1st.

LOG BOOKS FOR CIVIL FLYING.

It is hereby notified :—

In accordance with the provisions of the Air Navigation Regulations, 1919, Schedule 5, Standard Log Books have now been prepared for use by Firms, Pilots and others engaged in Civil Flying, and are available at the prices shown :—

"Pilot's Log Book."	C.A. Form 24	Price 2s. 0d.
"Journey Log Book."	C.A. Form 26	Price 4s. 0d.
"Aircraft Log Book."	C.A. Form 27	Price 3s. 6d.
"Engine Log Book."	C.A. Form 28	Price 3s. 6d.

The Books are obtainable through any Bookseller or direct from H.M. Stationery Office, Imperial House, Kingsway, London, W.C.2, or their Agents.

N.B.—This Notice cancels Air Ministry Communiqué (no. 381), of Nov. 14th, 1919, which authorised temporarily the use of R.A.F. type Log Books.

NOTICE TO AIRMEN (No. 93).

AIR MINISTRY, Sept. 1st.

AERODROME LIST AMENDMENTS.

It is hereby notified : Additions and Amendments to Notice to Airmen, No. 81 (Consolidated List of Aerodromes), of July 20th, are as follows :—

LIST B(b).—(b) Stations temporarily retained for Services purposes the following should be deleted :—

Aerodrome.—Anglesey; Lat. 53 deg. 15 min. 0 sec. N; Long. 4 deg. 22 min. 30 sec. W.; Height above sea-level, 185 ft. *Nearest Railway Station* : Llangefni, 3 miles (L.N.W.R.); *Nearest Town* : Llangefni, 3 miles (by road); True bearing from aerodrome, E.

LIST C(b).—Licensed Civil Aerodromes. Civil Aerodromes licensed as "Suitable for Avro 504K and similar types of aircraft only." Except in very few cases accommodation does not exist. The licences have also been issued for limited periods only. Foreshore Aerodromes are not included. The following should be added :—

Aerodromes.—Taunton (Musgrove Farm); Lat. 51 deg. 1 min. 0 sec. N. Long. 3 deg. 7 min. 0 sec. W.; Height above sea level, 60 ft. *Nearest Railway Station* : Taunton, 1 mile (G.W.R.). *Nearest Town* : Taunton, ½ mile (by road); True bearing from Aerodrome, W.

Herne Bay; Lat. 51 deg. 22 min. 0 sec. N.; Long. 1 deg. 8 min. 30 sec. E.; 100 ft. Herne Bay, 2 miles (S.E. & C.R.); Herne Bay, 1 mile (by road); W.

Walsall; Lat. 52 deg. 35 min. 0 sec. N.; Long. 1 deg. 57. min. 0 sec. W.; 460 ft. Walsall, 2 miles (L. & N.W.R.); Walsall, 1¾ miles (by road); W.

Nuneaton; Lat. 52 deg. 31 min. 0 sec. N.; Long. 1 deg. 27 min. 0 sec. W.; 460 ft. (Approx.). Nuneaton, 1 mile (L. & N.W.R.); Nuneaton, ¾ mile (by road); W.N.W.

Wellingborough, Lat. 52 deg. 18 min. 30 sec. N.; Long. 0 deg. 40 min. 0 sec. W.; 200 ft. Wellingborough, ½ mile (M.R.); Wellingborough, 1¼ miles (by road); W.S.W.

NOTICE TO AIRMEN (No. 94).

AIR MINISTRY, Sept. 1st.

ISSUE OF METEOROLOGICAL REPORTS BY WIRELESS TELEGRAPHY.

It is hereby notified :

1. On and after Sept. 1st the *synoptic reports* issued by W/T from the Air Ministry and Aberdeen will be as follows :—

Air Ministry.—Call sign G.F.A.; Wave length 1,400 m. continuous wave: Times of issue—03.15 G.M.T.; 08.45 G.M.T.; 20.15 G.M.T.

Aberdeen.—Call sign B.Y.D.; Wave length 3,300 m.; Times of issue : 02.30 G.M.T.; 08.30 G.M.T.; 14.30 G.M.T.; 19.30 G.M.T.

2. Reports will be sent for the following stations :—

Place.	Identification Number
*Aberdeen	110
Lerwick	101
Tynemouth	118
*Manchester (Didsbury)	128
*Cranwell	131
Yarmouth	136
*Felixstowe	143
*Calshot	153
*Lympne	154
Croydon	159
Jersey	160
Scilly	166
Pembroke	169
Holyhead	174
*Glasgow	178
Malin Head	182
*Baldonnel	184
*Valencia	192
Stornoway	195
Ross-on-Wye	198
Blacksod Point	199

* See paragraph 4.

3. The identification number of each station will be followed by three groups of five figures represented symbolically by :

BBBDD FwwTT βbbHV; where BBB equals Barometer in millibars and tenths (initial 9 or 10 omitted); DD—Wind direction at surface on the scale ¶-32 (08—E, 16—S, 20—S.W., etc.); F—Wind force on Beaufort Scale; ww—Present weather (see Code 1); TT—Temperature in degrees Fahrenheit; β—Characteristic of barometric tendency (see Code 2); bb—Amount of barometric tendency in half millibars (50 added for negative tendency); H—Humidity (see Code 3); V—Surface visibility (see Code 4). A hyphen - (morse signal - ... -) will be used in the place of any missing figure.

4. In the case of stations marked * a fourth group will be added, when possible, as follows :

2 DDVV; where DD—Direction of wind at 2,000 ft. on the scale 0-72; actual direction in degress from North is obtained by multiplying code figures by 5; VV—Speed of wind at 2,000 ft. in miles per hour.

5. The necessary codes are attached. The fog scale is that given in Annex G of the Convention for International Air Navigation.

6. *General Inferences* in plain language, based upon observations at 07.00 and 18.00 G.M.T., will be issued by Air Ministry Wireless Station at—09.15 G.M.T., 20.00 G.M.T.

7. The following is an example of such an inference :

"Pressure has again become high over Iceland, and a deep depression over the Skagerak region is increasing in intensity. The resultant North-Westerly to Northerly wind current over the British Isles will maintain rather cold weather, with local showers and variable skies during the next day or two."

8. Notice to Airmen (No. 58), of May 31st, 1920, is hereby cancelled

CODE 1.

PRESENT WEATHER (ww).

Note 1.—This code is used both for land and sea observations, so that some of the figures are not actually used at sea. All the figures are, however, given here

Note 2.—00 to 49 weather without precipitation; 50 to 70 and 77 to 97 with precipitation; r equals rain; d—drizzle; h—hail; s—snow; rs—sleet; tlr—thunderstorm; e—wet air; f—fog; b—cloudless, or nearly cloudless; bc—about half clouded; c—about three-quarters clouded; o—overcast, or nearly overcast.

No Fog, or precipitation (00-05).—00 Absolutely cloudless; 01 Cloud less than half; 02 About half clouded; 03 About three-quarters clouded; 04 Overcast, but small amount of blue visible; 05 Absolutely overcast.

Haze, Mist or Fog, with cloud above, but no precipitation (06-13).—06 Overcast and 1f; 07 Overcast and 2f; 08 Overcast and 3f; 09 Overcost and 4f; 10 Overcast and 5f; 11 Overcast and 6f; 12 Overcast and 7f; 13 Overcast and 8f.

Haze or Fog, but no precipitation (14-21).—14 Haze 1f; 15 Haze 2f; 16 Fog 3f; 17 Fog 4f; 18 Fog 5f; 19 Fog 6f; 20 Fog 7f; 21 Fog 8f.

Mist or Wet Fog, but no precipitation (14-21).—14 Haze 1f; 15 Haze 2f; 24 Fog 3fe; 25 Fog 4fe; 26 Fog 5fe; 27 Fog 6fe; 28 Fog 7fe; 29 Fog 8fe.

Special Phenomena, without precipitation (30-49).—30 e (Wet air); 31 Exceptional visibility; 32 Dust haze; 33 Dew; 34 Hoar frost; 35 Rime; 36 Glazed frost; 37 Glazed roads; 38 Solar Halo; 39 Lunar Halo, 40 Solar Corona; 41 Lunar Corona; 42 Aurora; 43 Squalls; 44 Gale; 45 Gloom; 46 Ugly, threatening; 47 Thunder; 48 Lightning; 49 Thunder and lightning.

Precipitation and Fog (50-58).—50 Slight rain, 51 Moderate rain, 52 Heavy rain, 2f or 3f; 53 Slight rain, 54 Moderate rain, 55 Heavy rain, 4f or 5f; 56 Slight rain, 57 Moderate rain, 58 Heavy rain, 6f to 8f.

Precipitation and Squalls of Wind (59-70).—59 Slight rain; 60 Moderate rain; 61 Heavy rain; 62 Slight rain and hail; 63 Moderate rain and hail; 64 Heavy rain and hail; 65 Slight sleet; 66 Moderate sleet; 67 Heavy sleet; 68 Slight snow; 69 Moderate snow; 70 Heavy snow.

Snow Covering (71-73).—71 Snow over whole country; 72 Snow with bare patches; 73 Deep drifts.

Dust Storms (74-76).—74 Slight dust storm; 75 Moderate dust storm; 76 Dense dust storm

Precipitation without Squalls or Fog (77-91).—77 Slight drizzle; 78 Moderate drizzle; 79 Thick drizzle; 80 Slight rain; 81 Moderate rain; 82 Heavy rain; 83 Slight hail; 84 Moderate hail; 85 Heavy hail; 86 Slight sleet; 87 Moderate sleet; 88 Heavy sleet; 89 Slight snow; 90 Moderate snow; 91 Heavy snow.

Thunderstorms (92-97).—92 Slight tlr, 93 Moderate tlr, 94 Heavy tlr, without hail; 95 Slight tlr, 96 Moderate tlr, 97 Heavy tlr, with hail; 98 Line squall, or "grain."

CODE 2.

CHARACTERISTIC OF BAROMETRIC TENDENCY (β).

0 equals Steady; 1—Unsteady; 2—Rising; 3—Falling; 4—Falling, then rising; 5—Steady, then rising; 6—Steady, then falling; 7—Falling, then steady; 8—Rising, then steady or falling; 9—Line squall.

CODE 3.

HUMIDITY (H)

0 equals 95-100 per cent.; 9—90-94 per cent.; 8—80-89 per cent.; 7—70-79 per cent.; 6—60-69 per cent.; 5—50-59 per cent.; 4—40-49 per cent.; 3—30-39 per cent.; 2—20-29 per cent.; 1—10-19 per cent.

CODE 4.

VISIBILITY (V).

Description.—0—Objects not visible at 50 metres (or yards); 1—Objects visible at 50 metres, but not at 200 metres (or yards); 2—Objects visible at 200 metres, but not at 1,000 metres (or yards); 3—Objects visible at 1,000 metres, but not at 2,000 metres (or yards); 4—Objects visible at 2,000 metres, but not at 4,000 metres (or yards); 5—Objects visible at 4,000 metres, but not at 7,000 metres (or 4½ miles); 6—Objects visible at 7,000 metres, but not at 12,000 metres (or 7½ miles); 7—Objects visible at 12,000 metres, but not at 20,000 metres (or 12 miles); 8—Objects visible at 20,000 or more; 9—Objects visible at above 30,000 (20 miles), and exceptional clearness.

NOTICE TO AIRMEN (No. 95).

AIR MINISTRY, Sept. 2nd.

PYROTECHNIC DEMONSTRATIONS—DARTFORD, KENT.

It is hereby notified:—

Demonstrations of Lights, Flares, Rockets and Signal Grenades, in connection with experimental research work, take place from a position about one mile south of Joyce Green Aerodrome and about two miles north of Dartford.

The programme of this work depends to some extent upon the weather, and a demonstration may therefore be arranged at any time and so preclude notice being given.

Pilots are accordingly warned against mistaking these displays for Aerodrome signals

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.

Where times are missing it is probably owing to Atmospherics affecting signals.

The London Terminal Aerodrome, Croydon.

(Compiled by the Staff of THE AEROPLANE.*)*

AUGUST 30th:

A.T.&T., DH9, G-EAQN, London-Amsterdam, 11.30-1430, G., 1, Forson.
I.A.L., Vimy, G-EASI, London-Paris, 12.50-16.40, Nil, 3, Chattaway & 1.
A.T.&T., DH9, G-EAOZ, London-Paris, 13.25-15.35, G., Nil, Reeves.
A.T.&T., DH16, G-EASW, London-Paris, 17.00-19.05, G.&M., 3, Tebbitt.
A.T.&T., DH16, G-EASW, Paris-London, 09.50-13.00, G., 3, Tebbitt.
C.desG.E.A., Goliath, F-HMFU, Paris-London, 13.15-17.23, G., 2, Favreau
A.T.&T., DH9, G-EAQP, Amsterdam-London, 14.30-18.25, G., 1, Hinchcliffe.
A.T.&T., DH9, G-EAGY, Amsterdam-London, 15.18-17.40, G.&M., Nil, Holmes.
A.T.&T., DH9, G-EAQL, Paris-London, 16.30-19.19, Nil, 2, Milnes.
A.T.&T., DH9, G-EAOZ, Paris-London, 16.40-19.17, Nil, 2, Lines.

AUGUST 31st:

A.T.&T., DH9, G-EAOZ, London-Paris, 09.45-11.50, Nil, 2, Powell.
A.T.&T., DH9, G-EAGY, London-Amsterdam, 10.45-1405, G., Nil, Bamber.
A.T.&T., DH9, G-EAPL, London-Paris, 10.55-12.20, G., 1, Armstrong.
A.T.&T., DH9, G-EAQP, London-Amsterdam, 11.30-1508, G., Nil, Hinchcliffe.
P., Caudron, F-ABEX, London-Le Crotoy, 16.10—, Nil, Nil, Mdlle. Boland
P., Caudron, F-ABDT, London-Le Crotoy, 16.10—, Nil, 1, Maicon.
A.T.&T., DH9, G-EAQL, London-Paris, 16.37-18.35, G.&M., 1, Holmes.
A.T.&T., DH16, G-EASW, Paris-London, 0955-13.40, Nil, 4, Reeves.
I.A.L., Vimy, G-EASI, Paris-London, 12.55-17.25, Nil, 8, Chattaway & 1.
A.T.&T., DH9, G-EAQN, Amsterdam-London, 16.25-18.45, M., Nil, Forson
A.T.&T., DH9, G-EAPL, Paris-London, 17.00-19.40, Nil, 2, Armstrong.
A.T.&T., DH9, G-EAOZ, Paris-London, 17.00-19.40, Nil, 2, Tebbitt.

SEPTEMBER 1st:

A.T.&T., DH18, G-EAUF, London-Paris, 10.00-12.08, G.&M., 4, Forson.
A.T.&T., DH9, G-EAPL, London-Amsterdam, 10.15-13.18, G., Nil, Milnes.
C.desG.E.A., Goliath, F-HMFU, London-Paris, 11.07-14.15, G., 1, Favreau.
A.T.&T., DH9, G-EAOZ, London-Paris, 16.30-18.30, Nil, 2, Reeves.
A.T.&T., DH9, G-EAQN, London-Paris, 16.50-1918, G.&M., 1, Lines.
A.T.&T., DH9, G-EAQL, Paris-London, 10.10-12.55, Nil, 2, Holmes.
C.desG.E.A., Goliath, F-GEAD, Paris-London, 12.25-15.40, G., Nil, Labouchere.
A.T.&T., DH9, G-EAGY, Amsterdam-London, 15.30-18.20, G.&M., 1, Bamber.
A.T.&T., DH18, G-EAUF, Paris-London, 17.00-19.20, G., 4, Forson.

SEPTEMBER 2nd:

A.T.&T., DH18, G-EAUF, London-Paris, 09.50-11.55, G.&M., 4, Armstrong.
A.T.&T., DH9, G-EAQL, London-Amsterdam, 11.20-14.25, G., Nil, Carter.
A.T.&T., DH16, G-EASW, London-Paris, 12.10-14.15, Nil, 3, Tebbitt.
I.A.L., Vimy, G-EASI, London-Paris, 12.50-15.30, Nil, 3, Barnard & 1.
A.T.&T., DH9, G-EAOZ, Paris-London, 09.50-12.20, G., 2, Reeve.
A.T.&T., DH9, G-EAQN, Paris-London, 10.00-12.50, Nil, 2, Lines.
M.A., Spad, F-CMAV, Paris-London, 13.00-19.15, G.&M., Nil, Bourdon.

SEPTEMBER 3rd:

A.T.&T., DH9, G-EAQN, London-Amsterdam, 11.05-14.20, G., Nil, Bamber.
A.T.&T., DH9, G-EAGY, London-Paris, 11.05-13.25, M., 2, Holmes.
A.T.&T., DH16, G-EAPM, London-Paris, 11.10-13.25, G., 3, Forson.
C.desG.E.A., Goliath, F-GEAD, London-Paris, 11.52-14.50, G., 3, Labouchere.
M.A., Spad, F-CMAV, London-Paris, 12.45-16.30, Nil, Nil, Bourdon.
A.T.&T., DH18, G-EAUF, London-Paris, 17.05-19.20, G.&M., 5, Armstrong.
A.T.&T., DH9, G-EAQP, Amsterdam-London, 08.50-14.35, M., 2, Hinchcliffe.
A.T.&T., DH16, G-EAPT, Paris-London, 11.25-13.59, Nil, 1, Tebbitt.
A.T.&T., DH18, G-EAUF, Paris-London, left at 17.00 on 2nd, arrived 11.35 on 3rd, G.&M., Nil, Armstrong.
A.T.&T., DH9, G-EAPL, Amsterdam-London, 15.13/2nd-11.35, Nil, Nil, Milnes.
C.desG.E.A., Goliath, F-HMFU, Paris-London, 11.45-15.30, G., 1, Favreau
I.A.L., Vimy, G-EASI, Paris-London, 13.20-20.23, Nil, 7, Barnard & 1.
A.T.&T., DH9, G-EAQL, Amsterdam-London, 15.51-18.50, G.&M., 1, Carter.
A.T.&T., DH16, G-EASW, Paris-London, 17.05-18.55, G., 1, Holmes.

SEPTEMBER 4th:

A.T.&T., DH16, G-EAPT, London-Paris, 10.05-12.35, G.&M., 3, Reeves.
A.T.&T., DH9, G-EAQL, London-Paris, 10.15-12.48, G., 1, Milnes.
A.T.&T., DH16, G-EAPM, London-Paris, 16.53-19.05, G.&M., 3, Tebbitt.
A.T.&T., DH16, G-EAPM, Paris-London, 10.00-12.34, G., 3, Tebbitt.
A.T.&T., DH9, G-EAGY, Paris-London, 10.05-12.26, Nil, 1, Armstrong.

SEPTEMBER 5th:

A.T.&T., DH9, G-EAGY, London-Berck, 10.06—, Nil, 1, Shaw.
A.T.&T., DH9, G-EAQP, London-Paris, 10.20-13.25, Nil, 2, Carter.
C.desG.E.A., Goliath, F-HMFU, London-Paris, 10.50-14.20, Nil, Nil, Favreau.
A.T.&T., DH18, G-EAUF, Paris-London, left 16.50 on 4th, arr. 10.45 on 5th, G., 6, Powell.
A.T.&T., DH16, G-EAPM, Paris-London, 11.35-14.15, Nil, 2, Reeves.
A.T.&T., DH9, G-EAGY, Berck-London, —19.30, Nil, Nil, Shaw.

The Air Port of Cricklewood.

(Compiled from Log of Cricklewood Aerodrome. Times on the Continent from Air Ministry Communiques.)

AUGUST 30th:

H.P.T., HP, G-EATL, London-Lausanne, 10.35-18.35, Nil, 1, Hope & 1.
H.P.T., HP, G-EASL, London-Paris, 12.20-15.30, G., 6, McIntosh & 1.
M.A., Breguet, F-CMAC, London-Paris, 12.45-15.20, Nil, Nil, Chailloux.
H.P.T., DH9, G-EAUH, Amsterdam-London, —14.45, M., Nil, Moore.
H.P.T., DH9, G-EAUI, London-Brussels, 17.00—, M., Nil, Hill.
H.P.T., HP, G-EASN, London-Amsterdam, 16.15—, G.&M., 1, Wilcockson & 1.
H.P.T., HP, G-EASN, Paris-London, 13.00-16.30, G., 6, Perry & 1.
H.P.T., DH9, G-EAUQ, Paris-London, —17.50, Nil, 2, Fowler.
H.P.T., DH9, G-EAUP, Brussels-London, 15.15-19.10, G.&M., 2, Rogers.

AUGUST 31st:

H.P.T., HP, G-EAIX, London-Paris, 12.08-14.55, G., 8, Bager & 1.
H.P.T., DH9, G-EAUN, London-Brussels, 14.40-17.17, M., Nil, Perry.
H.P.T., HP, G-EASN, Amsterdam-London, —16.05, M., Nil, Wilcockson & 1.
H.P.T., DH9, G-EAUQ, London-Amsterdam, 16.15—, M., Nil, Jones.
M.A., Breguet, F-SMAB, Paris-London, 13.00-16.10, G.&M., Nil, Le Main
H.P.T., HP, G-EASL, Paris-London, 12.30-16.50, Nil, 8, Olley & 1.

SEPTEMBER 1st:

H.P.T., HP, G-EASZ, London-Paris, 09.41-12.25, Nil, Nil, Beal & 1.
H.P.T., HP, G-EATN, London-Paris, 12.00—, G., 7, Rogers & 1.
M.A., Breguet, F-CMAB, London-Paris, 12.35—, G., Nil, Le Main.
H.P.T., DH9, G-EAUI, Brussels-London, —13.15, G.&M., Nil, Hill.
S.N.E.T.A., Goliath, O-BLAN, Brussels-London, 10.12-14.00, Nil, 7, Georges & 2.
H.P.T., DH9, G-EAUP, London-Amsterdam, 16.35—, G.&M., 2, Fowler.
H.P.T., HP, G-EAIX, Paris-London, 12.30-16.15, Nil, 1, Bager & 1.
H.P., DH4, O.8, London-Brussels, 17.12-20.05, Nil, 1, Moore.
H.P.T., DH9, G-EAUN, Brussels-London, —17.50, G.&M., Nil, Perry

SEPTEMBER 2nd:

H.P., DH4, O.12, London-Brussels, 10.15-12.00, Nil, Nil, Foot & 1.
H.P.T., HP, G-EATK, London-Paris, 12.00-15.10, G., 7, Olley & 1.
H.P.T., HP, G-EATH, London-Brussels, 14.40-17.35, G.&M., Nil, Bager & 1.
H.P.T., HP, G-EASY, Paris-London, 13.00-16.33, G., 6, Rogers & 1.

SEPTEMBER 3rd:

H.P.T., DH9, G-EAUP, Amsterdam-London, —10.45 (landed at Wormwood Scrubs, 2/9/20), Nil, 2, Fowler.
H.P.T., HP, G-EATM, London-Paris, 12.08-15.15, G., 2, Jones & 1.
H.P.T., DH9, G-EAUN, London-Brussels, 14.40—, G.&M., 1, Perry.
H.P.T., DH9, G-EAUP, London-St. Inglevert, 15.10-16.20, Nil, 1, Fowler.
H.P.T., DH9, G-EATA, London-Amsterdam, 16.38—, G.&M., Nil, Rogers
H.P.T., HP, G-EATK, Paris-London, 12.45-16.11, G.&M., 7, Olley & 1.
H.P.T., HP, G-EATH, Brussels-London, 15.00-18.20, M., 8, Bager & 1.

SEPTEMBER 4th:

H.P.T., HP, G-EATG, London-Paris, 12.12-15.40, G., 6, Wilcockson & 1.
H.P.T., DH9, G-EAUN, Brussels-London, 15.15-18.25, M., 1, Perry.

SEPTEMBER 5th:

H.P.T., DH9, G-EAUP, St. Inglevert-London, —10.25, Nil, Nil, Fowler.
H.P.T., HP, G-EATM, Montroy-London, —13.00, Nil, 5, Jones & 1.
H.P.T., HP, G-EAIX, London-Paris, 16.05—, Nil, 7, Olley & 1.
H.P.T., DH9, G-EAUN, London-Amsterdam, 16.20—, G., Nil, Hill.

Inland Flying at Croydon.

Aug. 30th.—A.T.T., Ltd., D.H.9, test; I.A.L., D.H.4, 2 joy-rides.

Aug. 31st.—I.A.L., D.H.4, Brighton return.

Sept. 1st.—A.T.T., D.H.9, 2 joy-rides; I.A.L., D.H.4, Brooklands, return, twice; Vimy, Brooklands, return.

Sept. 2nd.—A.T.T., Ltd., D.H.9, test.

Sept. 3rd.—Nil.

Sept. 4th.—Nil.

Sept. 5th.—A.T.T., Ltd., D.H.9, 2 joy-rides; I.A.L., Vimy, 1 joy-ride.

Inland Flying at Cricklewood.

Aug. 30th.—H.P.T., H.P., 2 tests.
Aug. 31st.—A. V. Roe and Co., Avro from Martlesham.
Sept. 1st.—H.P.T., H.P. from Lympne; H.P., D.H.4, test; H.P.T., H.P., 2 tests; A. V. Roe and Co., Avro to Hounslow.
Sept. 2nd.—H.P., D.H.4, test.
Sept. 3rd.—H.P.T., H.P. from Lympne; H.P., D.H.9 from Hendon.
Sept. 4th.—H.P., D.H.4, test.
Sept. 5th.—Nil.

The London Terminal Aerodrome.

La Compagnie des Grandes Expresses Aériennes, who run the Farman "Goliath" machines, have erected an office at Croydon painted the well-known light blue which has always been the Farman colour. Those who were in the R.F.C. in the early days will remember the colour of the nacelles on Henris, Longhorns and Shorthorns. This colour looks very nice in small quantities, but for a whole office—" You'd be surprised! "

It is not true that the C.A.T.O. has been so encouraged by the success of the word "CROYDON" inlaid in white chalk on the aerodrome, that he has entered for the " *Daily Mail* world's record sale " competition.

A large crowd of people appeared again on Sunday afternoon and watched the Instone "Vimy" disporting itself. In spite of the atrocious weather, the A.T. & T. machines to Paris, Amsterdam, etc., arrived and departed to time as usual.—G. D.

A.T. and T. Notes.

On Monday of last week the Princess Antoine Bibesco (*née* Elisabeth Asquith), accompanied by her brother, Master Anthony Asquith, went to Paris in a D.H.18. Mrs. Asquith was present, and was photographed as usual. Master Anthony returned on the 6th.

Machines have all been running to schedule as usual, or doing even better. An Amsterdam machine, for example, beat its schedule time by half an hour, but this, of course, is by no means unusual.—G. D.

The Instone Air Line.

The "City of London" and "City of Cardiff" have both been to the city of Paris as usual during the week. On Friday evening at 20.23 Mr. Barnard came in on the "Vimy" in total darkness and made a splendid landing to the accompaniment of a pyrotechnic display by the aerodrome staff.

One day last week "Little Jimmy" was taken over to Brooklands to see his home. He spent a most enjoyable day with Vickers, Ltd., who gave him some new pumps and generally looked him over. The D.H.4 accompanied him. He got somewhat off his course on the homeward journey owing to mist.

The Instone office at Croydon is now looking very nice. On Saturday the hardworking traffic manager, Mr. Handover, was "discovered" hard at work as usual, but now in most comfortable surroundings, in which one can see the unmistakable touch of a woman's hand.

By the way, the notice "London, Paris and New York" to be seen about London does not intimate new activities of the I.A.L.; it is merely the name of a new revue.

On Sunday Mr. Barnard on "Little Jimmy," and a full house hurtled into the *cwigkeit*. There was a gusty wind blowing, and one doubts if all the passengers enjoyed their tea as they should. One is told that some passengers were recently delighted to hear that a hospital was to be erected at Lympne for the benefit of the air-sick.—G. D.

LepAerial Travel Bureau.

If one wishes to be enlightened on the question of whether civil aviation is dead or not one has only to spend a short time in the office of the LepAerial Travel Bureau in Piccadilly Circus. Mr. Loader has his work cut out dealing with the continual stream of those booking or inquiring about passages on air lines.

Their window, incidentally, is most ingeniously arranged with models, luggage labels, etc., and is one of the best possible advertisements for the air lines in existence.—G. D.

Speeding Up the Air Lines.

Handley Page Transport have a D.H.9 on the service of which the international identification marking is G-EAUP. One is not able to state at the moment whether or not the pilot wears spurs.—G. D.

An Aerial Transgression.

On Aug. 31st, at Marlborough Street Police Court, Mrs. Gretchen Menken, an American citizen, was fined £50 for importing nine revolvers by air from France. The leader for the prosecution was aptly named Muskett. Humphrey Wright, an aerodrome porter, was bound over.

The defence was that the revolvers were for a collection owned by Mrs. Menken's son. The magistrate remarked that the lady had behaved foolishly.

The revolvers were discovered owing to the fact that Wright grumbled about the size of his tip, the lady having presented him with one franc, value about fivepence.

An Official Appointment.

It is officially announced that on Sept. 6th Dr. George Clarke Simpson, F.R.S., D.Sc., from the Meteorological Department of the Government of India, takes up his duties as Director of the Meteorological Office, at the Air Ministry. Dr. Simpson succeeds Sir Napier Shaw, who has been Director since 1920.

Addlestone.

The Air Navigation and Engineering Co., Ltd. (Blériot's), of Addlestone, who have forsaken aviation (apparently for ever) and have been occupied with the construction of the Blériot " Whippet " light car, have recently discharged a considerable number of their employees.

Lang Propeller, Ltd., have also discharged a number of hands, but are continuing their airscrew work, which includes the supplying of airscrews to Vickers, Ltd., for their China order.—J. F. S.

Bedford.

Details are now to hand in connection with Mr. Gordon Riley's fatal accident. The machine was an Ack-W with 160-h.p. Beardmore engine. Mr. Riley had done very little flying on it and disliked it. He had a slight crash with it some weeks before. On the occasion of his death he was flying it to Hendon, where another pilot was going to take it over. The engine cut out when the machine was at 100 feet and it stalled and crashed.

Mr. Riley was 21 years of age and has been a pilot since 1917. A friend of his writes : "He was a great sportsman and good fellow, and he will be much missed by all who knew him."

Brooklands.

The Vickers works at Brooklands are about the busiest among the aircraft factories in the neighbourhood The order for 50 " Vimy " commercial machines (or " fat porters ") for China has yet to be completed, and in addition there are being constructed 30 instructional machines for the Chinese Government. These machines are moderately-sized " pusher " biplanes with " Eagle " Rolls-Royce engines. No further details have yet come to hand beyond the stupendously important fact that they are known as "Vims" (singular, "Vim"), doubtless because they instil that desirable characteristic into the pupil. This type is directly descended from the famous gun-carrier, and is said to be very useful for school work.—J. F. S.

Cambridge.

At a sale of aircraft and equipment and effects of the Cambridge School of Flying, an Avro in perfect condition fetched only £50. Three D.H.6 machines went for £2 5s., £3 10s. and £6 5s. In one of these latter one has personally crashed, and so can thoroughly testify to their excellence, and whoever has bought them for this price has got an excellent bargain.

A 50-h.p. Gnome engine went for 35s., and two airscrews for 7s. 6d. each. A new acetylene welding plant, with generator, was knocked down for £17 10s. "How are the mighty fallen"!!!—G. D.

Folkestone.

Flying at Folkestone is progressing as favourably as the weather will permit. The Avro has had a new 110-h.p. Le Rhône engine installed, and in consequence shows an improved performance. Among the passengers taken up have been a number of pilots of French, Belgian and Swiss nationality, including Chevalier Willy Coppens, D.S.O., the Belgian Air Attaché at the Court of St. James's.

Of the five members of the crew, all of whom served during the war, Mr. S. A. Martindale, the organiser, and Messrs. Martin and Fagg, the two ground engineers, both of whom have had considerable flying experience before and during the war, were invalided from the Service owing to injuries received on active service.

Lieut. Martindale entered the R.F.C. from the cavalry, and flew on active service in France, Egypt, Albania and Mesopotamia, and finally was a flight commander during the "Blazing the Trail" flight to Egypt on Handley Pages last year, being one of the few officers to get his machine safely to Cairo.

Major J. B. P. Ferrand, D.S.O., the pilot, served with considerable distinction in the R.N.A.S. and R.A.F., gaining his D.S.O. in 1915 for sinking a German T.B.D. off the coast of Flanders in a F.B.A. flying boat, in the days when bombs were discharged by dropping them by hand. Thereafter he

served both at home and in the Middle East, being finally taken prisoner by the Turks.

Judging from the consistent good work done in the past, and the success so far gained at Folkestone by Mr. S. A. Martindale, Major Ferrand, D.S.O., and Messrs. Martin, Fagg and Brown, the two ground engineers and mechanic respectively, so long as sufficient encouragement is forthcoming, they may be expected to accomplish whatever they may set out to do.—C. B.

Northolt.

On a recent visit to Northolt plenty of activity was to be seen. Miss Trafford was up on a Centaur 4, flying exceedingly well, and an R.A.F. Avro was doing instructional work.

A privately owned B.E.2e. arrived with an arrangement for blowing out clouds of graphite. It is an "hush-hush" machine, and there are various rumours as to its function in life. Some say that it is for cinema work, to make the machine appear as though it were in flames. It seems that a more difficult problem would have been to get an R.E.8, and make it appear as though it were *not* in flames.

Some say the B.E. is for signalling, but one would have thought that a recent invention, sometimes called "wireless," would have been better for this purpose. The most subtle suggestion is that the machine is owned by the local laundries and will be flown low over the surrounding houses (this does not mean Northolt is shut in by houses, as there is hardly a building near it) and discharge its graphite as a form of direct action against people who do their own washing and hang it in the back garden.

There are several privately owned machines at the aerodrome, and the "Bat" belonging to the Instone Air Line is under repair by the C.A.C. One also visited the gaunt skeleton of what was once the Kennedy "Giant" biplane. Judging by the ground in the vicinity, this machine is now used by local cows as a "God-bless-the-Duke-of-Argyll." Mr. Courtney, of "Semiquaver" fame, at one time did straights on this machine. One would have liked to see him do an "Aerial Derby Semiquaver" landing with it.

A French pilot landed at Northolt recently when coming from Paris and looking for Cricklewood. Having given up the search for that aerodrome, he landed at Northolt thoroughly "rattled." Miss Trafford at once volunteered to go up and give him a lead to Cricklewood. The French pilot, apparently fearful of being led astray by the fair sex, declined to be tempted. Eventually, Mr. Grey, one of the youngest and best of the Northolt pupils, went up and led him to his correct destination.

Mr. Joseph Edge, whose aerial photographs always create such interest, has his headquarters at Northolt, and showed one some exceedingly interesting views.—G. D.

Scarborough.

The Border Aviation Company carried out so much flying last week that they ran out of oil. To keep them going until their new supply arrived various members of the company toured the town with bottles buying up supplies of castor oil from chemists.

One man celebrated his 77th birthday by making a flight, and another man of 64 was carried.

On Saturday, Aug. 28th, a man came and asked to be taken to Maidenhead to attend a dance at Murray's. Unfortunately the company were too busy with joy-rides to comply with his request.

On Sept. 4th, while flying an Avro belonging to the Border Company, Capt. Oliver, with two passengers, was forced to land in the sea. He intended to land on the South Sands, but owing to the crowd this was impossible without great risk. The machine was damaged slightly, but neither pilot nor passengers were hurt.

Woking.

According to reports, the "discharge" epidemic had spread to Martinsyde, Ltd., and nearly all the aircraft workers were supposed to be paid off. However, on inquiry one discovers that such is not the case, and that only a few aircraft fitters have left, and that the aircraft work is proceeding smoothly.

The "Semiquaver" is practically ready for flying again, and should be out for tests soon, preparatory to the Gordon Bennett Race.

The twin-engined machine, about which one can obtain no details, is also nearing completion and will be in the air shortly. No new designs or machines are projected at the moment.

Mr. R. H. Nisbet is not expected to do much flying in Canada, but is surveying certain districts with a view to the employment of Martinsyde aeroplanes for commercial purposes in that country.—J. F. S.

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

A Flight Rewarded.

The Commonwealth Government have announced their intention of awarding £500 each to Lieuts. Parer and McIntosh in recognition of their flight from England to Australia. The money was to be presented to the aviators upon their arrival in Melbourne.

The Completion of a Great Flight.

On Aug. 29th, Lieuts. Parer and MacIntosh, who had left Sydney for Bathurst on the way to Melbourne, damaged their machine in a bad landing near Culcairn. The aviators were forced to land owing to magneto trouble and mistook a ploughed field for grass-land. The machine was so badly damaged as to be beyond repair. The aviators proceeded to Melbourne by train.

The Australian Defence Department lent the aviators another machine with which to finish their flight. The aviators motored to the railway junction at Albury to fetch this machine, and then flew back to Culcairn in order that their flight would not be broken.

On Aug. 31st Lieuts. Parer and MacIntosh arrived at Melbourne, and landed on the Flemington Racecourse. They were accorded an official welcome. The bottle of whisky which had been brought intact from London was presented to Mr. Hughes, the Australian Premier, upon their arrival.

The Australian Aircraft and Engineering Co.

The Australian Aircraft and Engineering Co. have been the first in the field in establishing an aerial mail service in Australia. By arrangement with the Deputy Postmaster-General, a trial flight was to be carried out between Lismore to Tenderden and back, calling at Casino on the out and home journeys. The weight of mail was not to exceed 200 lb. with passenger, or 250 lb. without passenger, and the pilot was to call for and deliver the mail at the post office at each of the places mentioned.

On June 26th, an Avro piloted by Mr. F. L. Roberts covered the distance of 81 miles in an hour's flying time, the company receiving verbal congratulations from various authorities.

A further experiment in aerial mail carrying from Sydney to Lismore, a distance of 300 miles, passing over Newcastle, Kempsey and Grafton, was to be demonstrated later.

An Avro belonging to the Australian Aircraft and Engineering Co. was dispatched in July to Queensland, of which the greater part of the inhabitants had never seen an aeroplane.

It is intended that the present Australian Aircraft and Engineering Co. is to be wound up and floated into a limited company.

During the aerial welcome accorded to the Prince of Wales on arrival at Sydney, a D.H.6, piloted by a Mr. Webb, was forced to land, owing to engine trouble, in Wooloomooloo Bay. By smart work on the part of a police launch the machine was secured and towed to the wharf before it sunk. The A.A. and E. Co. was given the order to repair it.

A number of other machines took part in the aerial welcome, including Avros, D.H.6s and one State Government Curtiss.

A Flying Campaign.

The acting Premier of Queensland (Mr. Fihelly) and Mr. Theodore are both making arrangements for an extensive election tour by aeroplane at the coming General Election. During the last New South Wales election this method was adopted by Mr. Holman, who was, however, defeated.

SOUTH AFRICA.

A Hint to Manufacturers.

A correspondent at Bulawayo, Southern Rhodesia, who is quite competent to write on aeronautical matters, says that the joy-ride business is very nearly exhausted in South Africa owing to the small population. He is, however, convinced that there are great opportunities for privately owned machines in the future, but he emphasises the fact that makers will have to design for the South African market. Machines must be economical to run with petrol at 6s. a gallon. People will not look at 110 h.p. rotary engines or 300 h.p. Suizas.

According to this writer, what is wanted is an aerial Ford. One ventures to suggest that something on the lines of the Avro triplane, but lighter, and fitted with the good old reliable 160-h.p. Beardmore engine, would probably meet the case. Though one does not of course place either that excellent aeroplane or the Beardmore engine on the basis of the Ford as regards finish, it is rather a compliment to either to say that they are as reliable under constant use as is the Ford car.

G. R.

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Tenders are invited for the purchase of Aviation Suits (new and part worn), Airmen's Boots (new and part worn), Caps and Helmets suitable for commercial flying, motoring, etc.

The goods may be inspected at the respective depots on production of a form of tender. Samples, representative of the bulk of the new items (excepting boots), may also be seen at:—

The Office of the Controller (D.B.3.B.2), Ministry of Munitions, Earl's Court, S.W.5.

BIRMINGHAM: Ministry of Munitions, Room 48, 111, New Street.

DUBLIN: Ministry of Munitions, 124, Lower Baggott Street.

DUNDEE: 60, Victoria Road.

Samples of New Boots may be seen at **The Office of the Controller, (D.B.3.B.2), Ministry of Munitions, Earl's Court, S.W.5.**

Part-worn garments and boots should be inspected in bulk at the depots concerned.

Tender forms containing full particulars may be obtained on application to the **Controller (D.B.3.B.2), Room 23, Block C, Earl's Court Exhibition, Warwick Road, S.W.5** (Telephone: Hammersmith 2300, Extension 179), and are to be returned not later than 10 a.m., Wednesday, September 15th, in the envelope provided for the purpose.

FOREIGN INTELLIGENCE.

THE ARGENTINE.

The Argentine correspondent of THE AEROPLANE writes under date July 27th:—

Some Recent Flights.

Major Kingsley made a flight in his Airco 4 (375 Rolls-Royce), accompanied by Messrs. James Corbett and Jack Watson. Leaving the company's aerodrome at San Isidro, Buenos Aires, they arrived at Mr Corbett's ranch 80 minutes afterwards, the distance being 260 kilometres. The return trip will be made with the same passengers.

Lieut. Thompson has been making short flights at San Isidro on an Airco 6 and an Airco 16

Lieut. Hasset, who is successfully carrying out a tour through the Province of Cordoba and San Luis, flew from Jovita to Laboulaye. In the former town he made many passenger flights. After completing a number of exhibitions at Laboulaye, he proceeded to Lavalle and other neighbouring towns. He is using an Airco 6.

All the above-mentioned pilots are late members of the R.A.F.—"DUMSPIRAL."

Capt. John Pinder, a British officer, with Lieut. Martins, a Brazilian, have been killed near Lake Estobes, Brazil, during a flight from Rio de Janeiro to Buenos Aires for a prize offered by the Brazilian Government. It seems that they were killed in making a forced landing brought about by engine trouble.

BRAZIL.

The Minister of War has acquired already in Europe two Spads and four Avros, and has completed the arrangements for two more Spads, four Breguets, and one S.V.A. The last seven machines have been bought by public subscription for the international service between Montevideo, Rio de Janeiro and Santiago de Chile, in accordance to the ideas of Captain Cesario L. Berisso.—DUMSPIRAL.

CHILE.

The Argentine correspondent of THE AEROPLANE writes:—

The Aero Club of Chile is another of those institutions which agitate for the progress of flying, civil as well as military, and

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Designed by Burberrys, with the assistance of prominent airmen, with a view to satisfying the exacting demands of long-distance flying.

It is made up of three layers, each of a different material. The outside is of Burberry Gabardine, densely woven and proofed to withstand intense pressure from wind or rain. The second layer is a luxurious lining of fleece that supplies a wealth of warmth; whilst the innermost is of Glissade, a smooth-surfaced material, that enables the airman to slip in or out of the suit with celerity.

A double plastron of Burberry Gabardine across the chest and shoulders, a Puttee Collar, adjustable waist-belt, and devices for tightening the sleeves and legs, add comfort and stability to an outfit which insures complete security, yet is much less weighty and cumbersome than leather kit.

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with this object they commenced on July 23rd a course of civil instruction, under their exclusive patronage.

The introduction to the course was made by the President of the Club, who exhorted the young pupils to love their country like their own lives, and he praised them for the enthusiasm which they had shown by coming in such large numbers. There were three hundred pupils present. The director of the course was introduced to those assembled, and General Conteras Sotomayor was also in evidence.

With the idea of approaching a true knowledge of the subject the course has been divided into the following sections: Pilots under instruction, observers, technical, and mechanical.—DUMSPIRAL.

FRANCE.

A French correspondent of THE AEROPLANE wrote on Aug. 29th :—

The Caen Aero Club.

The meeting of the Caen Aero Club was well attended on Sunday. About twenty machines were there carrying passengers and giving exhibitions, including the 16 h.p. Aviette of Pischoff, and the D.H.18, both of which flew over from Le Bourget.

The Air Port of Le Bourget.

Aerodrome people get quite a lot of amusement still from the droll ideas and remarks of the passengers. Only last Friday a dear old lady held up the 4.30 bus while she ate enough to make her canteen bill come to an odd penny, as she had a ten centime stamp to get rid of.

On Monday an American party of six, who had only booked ordinary seats, refused to go on the afternoon Handley Page because there were some more passengers. If they could not go alone they would not go at all, and after letting the machine go away with half load, they stormed round the field asking everyone they met to give them their money back. In the meantime all the passenger cars had left.

As you knew, Mr. Ernoul extends his line to Nice this next week, and at the end of September the Society Avia proposes to start a winter service Paris-Nice. From Nice a local company is starting a seaplane service to Monte Carlo-Mentone and Corsica, where they will link up with the Italian line from Rome.—E. N.

The Aviation Meeting at Buc.

The aviation meeting at Buc, which will be held on Oct. 8th, 9th and 10th, is for French aviators only. On each day there will be a height-record contest. On Oct. 8th there will be held a cross-country race, and a quick ascent and descent contest; on the 9th a world's speed record attempt and a *concours d'adresse;* and on Oct. 10th, a commercial aeroplane contest, a *concours d'adresse* and a speed handicap.

The President of the French Republic has given his patronage to the meeting.

The Farman Brothers.

It is proper that the English should take deep interest in the career of the three Farman brothers, who, though French by adoption and interest, are English by birth. Their father was the Paris representative of the *Standard*, now dead, but once a power in the land. Their successes have honoured France, but some of the credit is due to England.

In an interview given to *L'Auto*, M. Henri Farman described the attributes of the trilogy and outlined briefly their progress in life. Henri himself was first interested in cycling, and with Maurice won many events on a tandem bicycle. Together invincible, separated they fell.

With the coming of the automobile their interests changed, and they became ardent racing drivers as well as successful business men. Henri competed at Nice, in the Paris-Berlin and Paris-Madrid races, and won the Paris-Dieppe race. On other occasions he raced petrol tricycles and motor boats, entered for racing contests, and swam with skill and vigour.

Mentally he was deeply interested in the arts and sciences, and still proudly maintains pleasant memories of the Ecole des Beaux Arts, where he completed his education. He entered aviation at the suggestion of M. Archdeacon, who inspired his fervent interests. The first efforts of the Antoinette Company in the production of a successful aero engine provided the energy for his first aerial leaps.

Maurice, his brother, had similar mechanical interests. Before succumbing to the calls of aviation he had acquired distinction as a balloonist and had become deeply interested in astronomy and meteorology. He had at Joigny a good observatory, and had produced several books on his favourite subjects. As a meteorologist he edited at one time the weather column of the *Figaro*.

Dick, the third brother, not the less interested in sport in all its branches, has been so busily engaged in organising the joint businesses of the brothers that his public sporting successes have been few.

The Tour of Lieut. Roget.

On Sept. 1st, Lieut. Roget, who is making a tour of Europe, arrived at Rome from Athens.

Lieut. Roget left Paris on June 9th. He hoped to make a non-stop flight to Warsaw, but was forced to land at Berlin. His route from there was *via* Posen to Warsaw on June 10th; Lemberg, June 22nd; Bucharest, June 28th; Constantinople, July 4th; Athens, July 17th.

It appears as if some delay must have occurred at the last-mentioned town, or on the flight thence to Rome. The tour was made with the idea of taking observations on the climatic conditions of the countries through which he passed.

As the paper goes to press it is stated that Lieut. Roget reached Paris on Sept. 7th.

The Registration of Aircraft.

The *Journal Officiel* dated August 14th published two decrees issued by the Under-Secretary of State for Aeronautics in regard to the registration of aircraft. The former deals with the certificates of registration (*certificats d'immatriculation*) and the latter with navigability certificates.

Registration certificates can only be granted to machines belonging to French firms, and no firm can be enregistered as owning aircraft if the firm is not of French nationality.

If an aircraft is found to be registered in two countries, such aircraft loses all its French registration benefits.

Immediately after registration the owner of the aircraft must inscribe the necessary registration letters on his machine. The mark of nationality is a large capital F in roman character followed by a registration group of four capital letters containing at least one vowel (the letter Y being considered as a vowel). These letters must be painted in black on a white ground on the under surface of the lower planes and on the upper surface of the top planes. In addition, they must be painted on each side of the fuselage. The exact sizes are specified in the decree.

Commercial aircraft are forbidden to use the tri-colour cockade painted on Government machines

The navigability certificates are issued by the Service de la Navigation Aérienne. It contains details of the "qualities of security" (as the French put it) of each machine for which it is granted. Apparently it resembles in general form and idea the Airworthiness Certificate issued by the British Air Ministry.

A Trial of the Bleriot "Mammoth."

On August 18th the Bleriot triplane "Mammoth" (four Hispano-Suiza engines), which has been entered for the French Government competition, was flown by M. Jean Casale for ten minutes at a height of 25 metres.

The Gordon Bennett Cup Race.

The Gordon Bennett Cup Race will take place this year on September 26th over the plain of La Beauce. The start will take place at Villesauvage, near Etampes, and a distance of about 186 miles will be covered. Entries have been received from three nations, France, Great Britain and the United States of America.

In the case of France five aeroplanes have been entered for the eliminatory trials, which will take place a few days before the race. These five are two Spads, two Nieuports and a Borel. Three will be selected for the case. M. Sadi Lecointe will fly a Nieuport and M. Jean Casale a Spad.

GERMANY.

The Danish correspondent of THE AEROPLANE writes :—

In Germany the slowness of the mail authorities to avail themselves of the aerial mail possibilities is also being criticised, particularly as all the Rumpler flights between Berlin and Leipzig during the exhibition were subsidised with 1,650 marks in each direction, to reduce the abnormal fuel costs in Germany, one realises.

Die Deutsche Luft-Rederei continues to expand its air services. The following lines are now being run regularly: Berlin-Warnemünde-Malmö and Hamburg-Warnemünde-Malmö, Hamburg-Bremen-Amsterdam, and Hamburg-Westerland. The Berlin-Leipzig route is only an occasional one during the bi-annual exhibitions at the latter city.

Up to Aug. 1st 5,300 flights with 5,038 passengers and 4.600 tons of mail and other cargo had been carried out, covering a distance of approximately 850,000 km. The company has now an agreement with the mail authorities and has this year again maintained services from the capital to the resorts on the Baltic and North Seas during the holiday season.

Johannisthal is the company's main air station, other permanent ones being located at Breslau, Leipzig, Danzig and Braunschweig.—E. H.

K.L.G. PLUGS.

The following letter has been received :—

Dear Sir,—It has come to our notice that K.L.G. aero plugs purchased from the Government are being offered for sale for use on motor cars, and we shall be glad if you will please announce in the next issue of your paper that K.L.G. aero plugs are totally unsuitable for any but aero engines, for which they were specially designed, and we cannot hold ourselves responsible for plugs sold by anyone but ourselves or by our own agents.

Yours faithfully,
p.p. S. Smith and Sons (M.A.), Ltd.,
(Signed) H. R. BUCKLAND.

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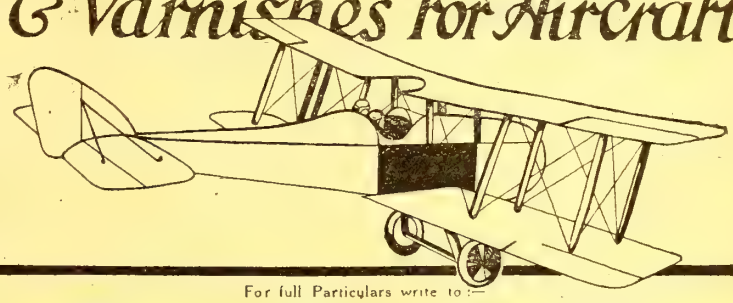

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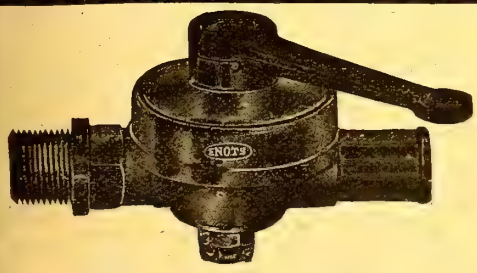

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S.B.A.C. THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS

THE ROYAL AERONAUTICAL SOCIETY.

Journal.—The September issue of the *Aeronautical Journal* is now available, and contains in addition to Sir Richard Glazebrook's paper, "Some Points of Importance in the Work of the Advisory Committee for Aeronautics," the following original papers:—

"Fluid Resistance on Bodies of Approximately Streamline Form," by J. R. Pannell, Fellow.

"Incidence Wires," by Miss Hilda Hudson, Associate Fellow.

"An Investigation into Various Types of Timber Splices for Aeroplone Construction," by Major G. W. C. Kave and Lt. J. Hudson Davies.

Library.—The following books have recently been received and placed in the Library:—

"Aerial Navigation," by J. E. Dumbleton, "The Advancement of Science"; 1920, "The Aeroplane Handbook," by A. J. Swinton; "In the Clouds Above Baghdad," by Lt.-Col. J. E. Tennant; "Airscrews in Theory and Experiment," by A. Page.

Lectures.—The following lectures have been arranged for the next session commencing on October 7th. The Lectures will in each case take place in the theatre of the Royal Society of Arts, John Street, Adelphi, commencing at 5.30 p.m. An abstract only will be read in order to permit of a full discussion. Where possible a summary will be published previously in the *Aeronautical Journal*, the full paper and discussion being printed afterwards as heretofore.

October 7th.—Major-General Sir F. H. Sykes, G.B.E., "Civil Aviation."

October 21st.—Sqdn. Ldr. R. M. Hill, R.A.F., "A Comparison of the Flying Qualities of Single and Twin-engined Aeroplanes."

November 4th.—H. Ricardo, "Possible Developments in Aircraft Engines."

November 18th, December 2nd, December 16th.—Col. Flack, "The Human Machine in Relation to Flying."

January 20th.—Lord Montagu of Beaulieu, "The Cost of Air-Ton Miles Compared with other Forms of Transport."

February 3rd.—G. Dobson, "Meteorology."

February 17th.—F. Handley Page, "The Handley Page Wing."

March 3rd.—J. W. W. Dyer, "Airship Fabric."

March 17th.—Capt. D. Nicolson, "Flying-Boat Construction."

September 3rd, 1920. W. LOCKWOOD MARSH, Secretary.

THE ROYAL AERO CLUB.

FLYING SERVICES FUND COMMITTEE.

A meeting of the Flying Services Fund Committee was held on Tuesday, Aug. 31st, 1920, when there were present: Group Captain C. R. Samson, C.M.G., D.S.O., R.A.F., in the chair, Lieut.-Col. Alan S. W. Dore, D.S.O, Mr. Chester Fox and the Secretary.

APPLICATIONS FOR ASSISTANCE.—Forty-five applications for assistance were considered, and grants and allowances voted amounting to £560.

COMMITTEE MEETING

A meeting of the Committee was held on Thursday last, Sept. 2nd, 1920, when there were present: Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair, Lieut.-Col. Spenser D. A. Grey, D.S.O., Squadron Leader T. O'B. Hubbard, M.C., R.A.F., Colonel F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. Mervyn O'Gorman, C.B., and the Secretary.

ELECTION OF MEMBERS.—The following new members were elected:—

Mario Arioli, Captain Cecil Egerton Leigh, the Buffs, Frederick Miller.

FLYING SERVICES FUND COMMITTEE.—The report of the meeting of the Flying Services Fund Committee held on Aug. 31st, 1920, was received and adopted.

FEDERATION AERONAUTIQUE INTERNATIONALE CONFERENCE, GENÈVA.—The following delegates are representing the Club at the Fédération Aéronautique Internationale Conference in Geneva on Sept. 8th, 9th and 10th, 1920:—

Lieut.-Col. F. K. McClean, Lieut.-Col. Mervyn O'Gorman, C.B., Major E. H. Tindal Atkinson, H. E. Perrin.

GORDON BENNETT AVIATION RACE.

The Gordon Bennett Aviation Race will behold at Villesauvage, near Etampes, about 30 miles south of Paris, on Sept. 28th, 1920, and the United States, France and Great Britain will each be represented by three machines.

The Club has selected the following competitors to represent Great Britain:—

Pilot—H. G. Hawker. *Machine*—Sopwith "Jupiter." *Engine*—450-h.p. Bristol "Cosmos."

F. P. Raynham. Martinsyde "Semiquaver." 300-h.p. Hispano-Suiza.

L. R. Tait Cox. Nieuport "Goshawk," 320-h.p. A.B.C. Dragonfly.

FLYING MACHINES FOR THE USE OF MEMBERS.

The Club has arranged with the Aircraft Disposal Company for the exclusive use of six flying machines for the members. The following types have been selected: Sopwith Pups, Avro, B.E.2d. and Armstrong-Whitworth. These machines will be kept at the Handley Page Aerodrome, Cricklewood.

All inquiries relating to hiring should be addressed to the Secretary of the Club.

BUC MEETING, OCT. 8th, 9th AND 10th, 1920.

The Aero-Club de France is arranging a meeting for French competitors at Buc on Oct. 8th, 9th, and 10th, 1920. On Oct. 10th there will be a race for transport machines on the lines Paris-Brussels and Paris-London.

The machines will fly from Buc to London or Brussels and return on the same day.

Machines flying on the Paris-London line will land at Waddon Aerodrome, Croydon, and, at the request of the Aero-Club de France, the Royal Aero Club will control the competition at the London terminus.

The following is an extract from the regulations:—

"Machines must conform to the following conditions:

"Postal machines (machines carrying postal bags only) to carry a load of at least 50 kg.

"Transport machines to carry a minimum of two passengers in addition to the crew; the passengers must be at least 18 years of age. On the outward journey the passengers must be on board; on the return journey each passenger may be replaced by 100 kg. of ballast. In the case of machines of 500-h.p. or more, the crew must consist of at least two persons.

"Starts will be made at Buc on Oct. 10th between 10 and 11 a.m. at times selected by the competitors, except in the case of several competitors choosing the same time, when the order of entry will be taken.

"The competition closes at 6 p.m."

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

MILITARY.

WAR OFFICE, Sept. 3rd.

REGULAR FORCES.—COMMANDS AND STAFF.—TANK CORPS.—Major (Bt. Lt.-Col.) G. W. P. Dawes, D.S.O., A.F.C. (R. Berks R.), is appointed to the Corps, July 14th, seniority Sept. 14th, 1916.

AIR FORCE.

AIR MINISTRY, Aug. 31st.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—Flying Officer C. S. Miller (O.) resigns his permanent commn., and is permitted to retain his rank, Sept. 1st.

SHORT SERVICE COMMISSIONS.—Flying Officer A. F. Alexander (A.) resigns his short service commn., and is permitted to retain his rank, Sept. 1st.

MEMORANDUM.—Wing Comdr. R. A. Bradley, C.M.G. (late Maj., N. Staffs. R.), having retired from the Army and relinquished his R.A.F. commn., retains the rank of Lt.-Col.

AIR MINISTRY, Sept. 3rd.

ROYAL AIR FORCE.—SHORT SERVICE COMMISSIONS.—The notifications in *Gazettes* of Dec. 5th, 1919, and Feb. 17th, 1920, appointing Flying Officer H. C. Price (A.) to a short service commission are cancelled.

FLYING BRANCH.—The following are placed on half pay list (Scale B): Flight Lt. J. A. Barron, July 27th; Flight Lt. G. B. Aufrere Baker, Aug. 20th; Flying Officer B. V. S. Smith, M.C., A.F.C., May 1st.

TECHNICAL BRANCH.—Flying Officer L. H. Hillier is restored to active list, April 12th; Flying Officer F. Susans, M.B.E., is placed on retired list, and is granted rank of Major, Sept. 4th.

MEMORANDUM.—The notification in *Gazette* of July 27th concerning Wing Commander J. W. O. Dalgleish, O.B.E., is cancelled.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

ENGAGEMENT.

LINDON—BROWN.—The engagement is announced of Capt. A. E. Lindon, R.A.F., eldest son of Mr. and Mrs. A. E. Lindon, of 26, Wray Crescent, N., and Rowena May, youngest daughter of the late William Brown, of Blenheim House, Bullingdon Road, Oxford.

BIRTH.

STEVENSON.—On Aug. 29th, at the Priests' House, Wellingore, Lincoln, Janet, the wife of Flt. Lt. D. Fasken Stevenson, R.A.F., of a son.

EMPLOYMENT.

[Except where addresses are given, communications should be sent c/o THE AEROPLANE, 175, Piccadilly, W.1.]

Corporal, late R.A.F., 3½ years R.F.C. and R.A.F., cabinet maker. Ground engineer's licence for all single-engined machines. Married. Willing to go abroad.—E.D.

COMING EVENTS.

SEPTEMBER.

8th, Thurs., 9th, Friday, 10th, Sat.—Federation Aeronautique Internationale Conference, Geneva.

18th, Sun., 19th, Mon.—Schneider Cup Race at Venice.

27th, Mon.—Gordon Bennett Cup Meeting at Etampes begins.

28th, Tues.—Gordon Bennett Cup Race at Etampes.

Last week.—Latvian Trade Fair, Riga, opens.

OCTOBER.

2nd, Sat.—Gordon Bennett Cup Meeting at Etampes closes.

7th, Thurs.—R.Ae.S. lecture. "Civil Aviation," by Major-Gen. Sir F. H. Sykes, G.B.E.*

8th, Fri., 9th, Sat., 10th, Sun.—French Aviation Meeting at Buc.

21st, Thurs.—R.Ae.S. lecture. "A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Sqdn. Ldr. R. M. Hill, R.A.F.*

23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.

23rd, Sat.—International Aero Exhibition, Prague, opens.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes.

2nd, Tues.—International Aero Exhibition, Prague, closes.

4th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo.*

18th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*

DECEMBER.

2nd, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*

16th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*

JANUARY—1921.

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology," by G. Dobson.*

17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

MARCH—1921.

3rd, Thurs.—R.Ae.S. lecture. "Airship Fabric," by J. W. W. Dyer.*

17th, Thurs.—R.Ae.S. lecture. "Flying-Boat Construction," by Capt. D. Nicolson.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30.

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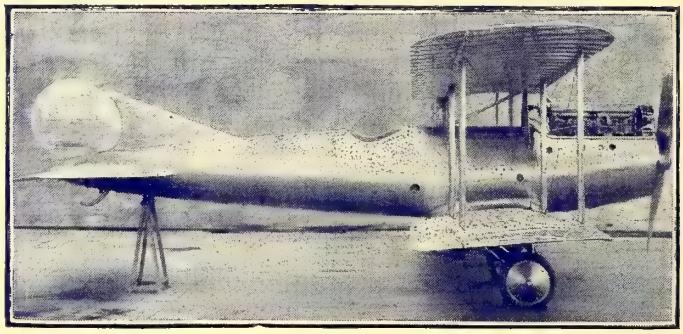

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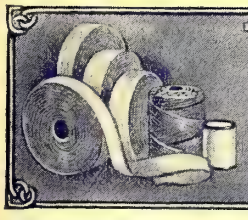

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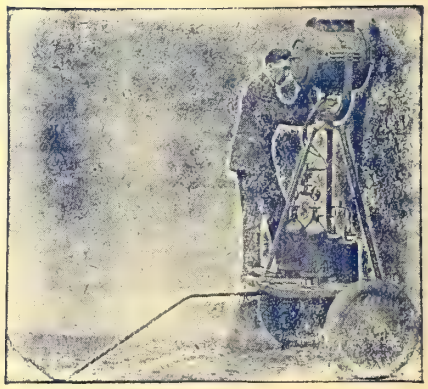

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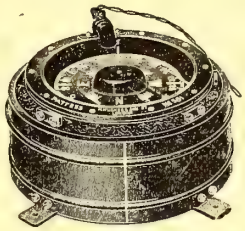

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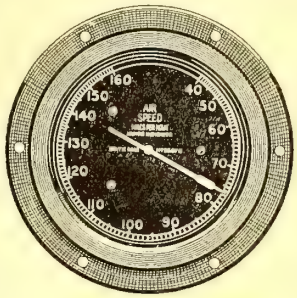

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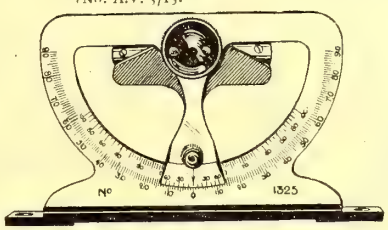

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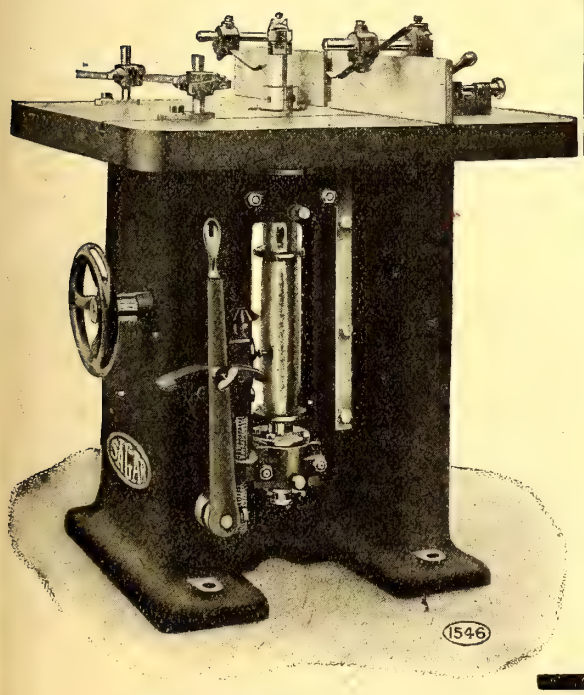

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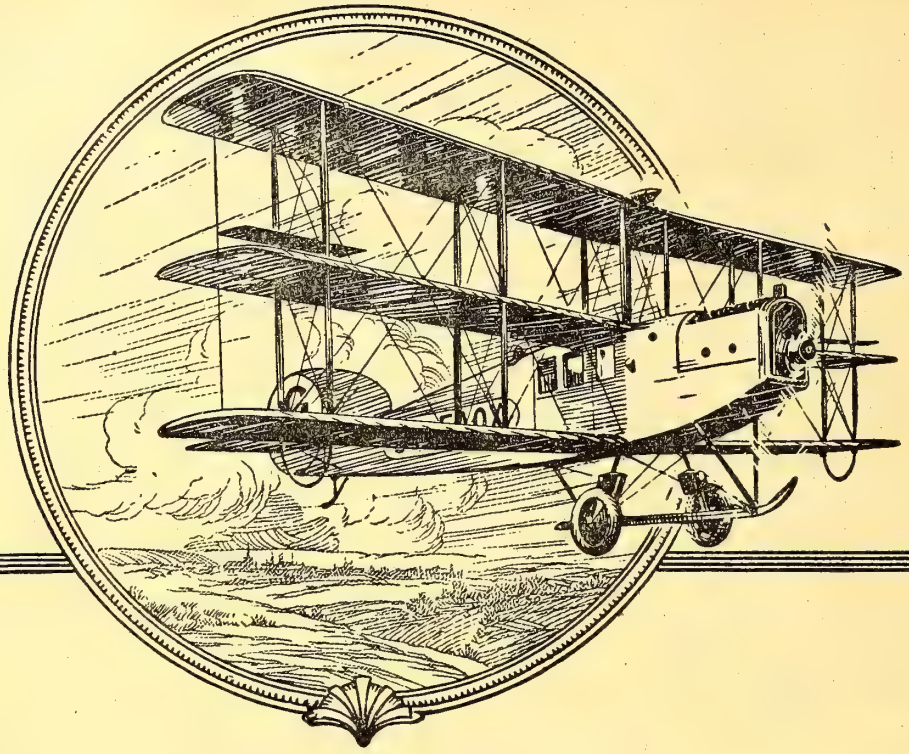

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THE AEROPLANE

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The Nieuport, sent by a firm the chief of which is Sir Samuel Waring, Bart., who received a Baronetcy for his services to aviation, is to be flown across France to Etampes by its plucky pilot, Mr. Tait-Cox, and Mr. James, another Nieuport pilot, will go by train accompanied by a couple of mechanics.

The Martinsyde will be towed by Mr. Raynham behind his own car to Southampton, shipped to Le Havre and towed to Etampes, to avoid the danger of landing so fast a machine in the country and to save the engine unnecessary wear and tear. He will be accompanied by Mr. Robert McGeagh Hirst and one mechanic. The Martinsyde firm say candidly that if they are to survive the slump they cannot spend money on sport.

One would have expected that a few English sportsmen would have taken some interest in the honour of British sport when it was known that the Aircraft Industry could not afford to compete in a style worthy of our national reputation, and would have put up a sum of money sufficient to allow the competing team to do the thing in style.

If the Sport of Flying is so dead as all that, then let us drop the pretence that the Royal Aero Club exists to foster the sport. Let us make it into a first-class co-operative hotel, let us drop the expense of salaried officials who are supposed to have to do with flying, let us engage a few more attendants, let us turn the offices into extra rooms for members, and let us at least be comfortable if we cannot be sportsmen.

When the Aero Club ran successful flying meetings before the war there were plenty of celebrities, of sorts, ready to patronise their meetings and to be photographed behind silver cups and trophies. But when it comes to doing something practical for the honour of British Sport, where are these celebrities?

Surely if all the gentlemen with high-sounding names who are members of the various lists of patrons, vice-presidents, committee-men and so forth, of the Royal Aero Club, took a real interest in Sporting Flying they could, between them and their friends in high places, have raised enough money to send to France a Gordon-Bennett team adequately equipped with mechanics, spare machines, spare engines, spare parts, and so forth. As it is, picture to yourselves the British Empire represented by two or three enthusiastic mechanics and a couple of sporting pilots. Think of young Mr. Tait-Cox flying a dangerously fast machines across country, and of Mr. Raynham laboriously trailing his machine along those interminable French roads, and reflect on the glory of the British Empire in the air.—C. G. G.

ON THE SECOND GREAT BLOW.

It was announced on Saturday, Sept. 11th, that the Sopwith Aviation and Engineering Co., Ltd., had shut down and had gone into voluntary liquidation. This is the second really great blow that has befallen British Aviation since the ending of the late lamented war. The first blow was the shutting down of the Aircraft Manufacturing Co., Ltd., though in a way that was less of a blow, for the Airco merely ceased to manufacture aircraft and became part and parcel of the B.S.A.-Daimler combine, but did not go into liquidation. Moreover, the Airco was always regarded more or less as a commercial affair, whereas there was a certain sporting element about the Sopwith Co. which, so to speak, won for it a species of personal affection among the members of the aeronautical community.

When one considers all the circumstances the closing of the firm is not altogether surprising. It is announced that 1,400 employees have been thrown out of work. It is probable that at no time have there been less than 1,000 hands on the pay-roll. At the present inflated price of so-called labour, that would mean a weekly pay-sheet of not much less than £4,000. Or roughly £200,000 a year for wages and salaries.

One can reckon material in any ordinary business as being just about equal to wages. So that material would also run to about £200,000 a year. And, allowing that the business has been running for about 18 months since the Government cut off all aircraft orders, that would mean an outlay of £600,000 at a very moderate estimate.

The Sopwith Company have always been notably good payers and it is believed that the amount owed to creditors is comparatively small, so that probably one will not be far out in estimating that the firm has paid out half a million pounds in hard cash. Against which their receipts can only have been what they have had from the sales of a thousand or so of motor bicycles, for it must be remembered that what with the moulders' strike, and other hindrances to output, deliveries in quantities cannot have begun very long before the slump in the motor trade shut down all possibilities of selling the output.

If there had been no moulders' strike and if all hands had combined from the very start to give the greatest possible output for wages received, and if deliveries had begun in quantities immediately after the last motorcycle show, it seems very probable that the money received from those sales would have carried the firm over the present dead season, even though a reduced number of hands might have had to work short time for a few months. As it is, some 1,400 representatives of free and independent British Labour will have an excellent oppor-

tunity of reflecting on the folly of quarrelling with their bread and butter, and will realise that high wages are not everything that they are cracked up to be, half a loaf being considerably better than no bread.

Possibly the management is not free from blame. Personally one has never believed in the Motor Trade as the refuge, or the happy hunting ground, of the out-of-work aeroplane maker. One has from the first prophesied an unholy slump in motor-mongering, simply because of obvious over-production at absurdly high prices. Also, the Aircraft Industry during the war, when production regardless of cost was the only consideration, was the worst possible school for manufacturers who had had little previous experience of the intricacies of commerce. The amateur business man has done the nation even more harm than has the amateur soldier and the amateur politician.

At any rate, the Directors, who are, one believes, almost the only shareholders, have done the right thing in shutting down while the firm is solvent, as it is said to be. It is only to be hoped that, after paying 20 shillings in the £1 to the creditors, they and the chief employees of the firm will have enough left to keep them comfortably till the revival of the Aircraft Industry affords them opportunities for selling at a good price the experience which they have acquired during the past few years.

It is sad that the name of Sopwith should disappear from places in which they aviate, or talk aviation, but, after all, the owner of a good name is the person most concerned with it and about it. And, if one can pay 20 shillings in the pound, no doubt a name looks as well on the title-deeds of a landed estate as on the side of a factory or on the name-plate of an aeroplane or motor-bicycle.

Of course, if Parliament had believed in a big Air Force and had ordered new machines to replace the hurriedly built products of war, there might have been enough orders to keep all the *bona fide* aeroplane firms at any rate alive, if not busy. But, the survival of the fittest is the first law of Nature, and if there *must* be a weeding out process, then let it be sharp and quick so that we may know the worst. It is better that some should die than that any should live by artificial feeding from Government sources.

One can only hope that there will be few other aircraft firms to follow the Sopwith example. A number of mushroom firms, which were merely war products, like the Whitehead affair, have disappeared, and the trade is well rid of them. One or two really good reliable concerns—the Hewlett and Blondeau concern is the most notable—have also closed down. There should be room for those who still survive, if they can last till next Spring, when new R.A.F. orders are expected to be issued in quite considerable quantities on a purely competitive basis. Perhaps then some far-seeing capitalist will reassemble the staff which made Sopwith aeroplanes so famous in the past, and we shall once more be able to include them among the world's best aircraft.

Meantime one expresses the deepest sympathy with all concerned, except those who are responsible for the firm's failure to survive the present bad times. And only the consciences of those people themselves can say who they are.—C. G. G.

THE AIR MINISTRY COMPETITION.

(Amphibian Section).

The following machines are now at Martlesham Heath :—

Vickers "Viking" III. Pilot, Capt. Cockerell.
Fairy. Pilot, Lieut. Colonel V. Nicholl, D.S.O.
Supermarine. Pilot, Capt. J. Hoare.

The results to date are :—

Vickers "Viking" III. Sept. 7th, 1920. Reliability and Economy W/G=10.4. Self-controlled flight. Sept. 8th, 1920. High Speed (121 m.p.h.=105.2 knots).

While getting off during the Getting Off tests, the undercarriage of this machine failed, causing damage to the port wing tip and float. Repairs were at once begun, and she was to be ready by the 14th inst.

The Fairey was to be ready on the same date and the Supermarine was to start her tests also on that day.

FOOL "PERFORMANCES."

The following letter has been received :—

Sir,—I see in the papers that at the meeting of the International Aeronautical Federation in Geneva the committee, including the British delegates from the Royal Aero Club, agreed the French speed record and passed as another official "performance" the antics of an aerial contortionist who looped several hundreds of times in succession.

Why *do* the F.A.I. act in this childish manner and *why* do the Royal Aero Club assist them in such idiocy?

There are several other "records" they might attend to :—

1. The maximum number of "write-offs" effected by any pilot without fatal results to himself. (General ******** barred.)

2. The long-distance "pianoforte playing record" by the lunatic at Peckham Rye, or wherever it is he lives. (Or should this be referred to the A.A.A.?)

[One believes it is the affair of the F.A.I., in view of the fact that wood and piano wires are used in making aeroplanes.—Ed.]

3. The record distance dropped from one aeroplane to another by the unfortunate cinema pilot who killed himself.

4. The maximum number of oysters carried by a Handley Page from London to Paris on a single flight.

Many others will suggest themselves to you.

The old members of the Royal Aero Club did wonderful work for aeronautics, but the days of aeronautics as a sport are probably gone for ever.

It is not seen how the activities of these semi-amateur, semi-informed bodies like the F.A.I. can confer any benefit whatever upon the serious and important business of aerial transport. (Signed) "Transport."

THE FRENCH AIR MAILS.

The French Post Office has now fallen into line with the British and the charge for letters from Paris to London by air is reduced from 3 fr. to 75 centimes per 20 grammes. This charge is in addition to the ordinary postage.

BELGIUM AND THE AIR POSTS.

It seems that the Belgian Post Office is very little better in its organisation than the French Post Office, of which one complained recently. Mr. E. V. Questier, of 15, New Broad Street, E.C.2, who was recently in Belgium on business for some time, carried out a series of tests in air mail delivery, which bore out this assertion.

Mr. Questier writes :—

> All the letters posted in London (Threadneedle Street) before 8 a.m. reached me at 8 a.m. the next morning when stamped at 2½d. plus 2d. When sent Express they reached me at between 6 and 7 a.m., much to my inconvenience, as the early delivery upset without any material advantage.

Reference to the time tables show that most of the air mail machines leave London about 14.30 hours. This means that they arrive in Brussels between 17.00 and 18.00 hours. Evidently in any well-organised Post Office these letters would be delivered by express post in Brussels by 21.00 hours at latest.

The idea of keeping these letters from 18.00 or 19.00 o'clock in the Brussels Post Office and then delivering them by express messenger at 06.00 or 07.00 in the morning is obviously absurd. In fact, unless the Belgian Post Office is very much less efficient than the Belgian railways, letters arriving in Brussels by 18.00 hours or even 19.00 hours, should be delivered in the ordinary way without express messenger, by the last post at night, even at towns some distance away, such as Antwerp.

THE LONDON "COUNTRY" CLUB.

It is officially stated that the London Flying Club will in future be known as the London Country Club, despite Hendon being distinctly a suburb.

It seems probable that the word "Flying" in the Club's former title frightened away many who were very desirable members of this fraternity. Furthermore, it attracted many who were thoroughly keen on flying and imagined that here they would find themselves right in the thick of practical aviation. They might even have tried to land on the much boosted Club aerodrome, only to find themselves bunkered.

Anyway, the change is all for the good, as now the Club will be purely and simply a pleasure club with no pretensions to anything higher. Other clubs please copy.—G. D.

NAVAL AND MILITARY AERONAUTICS.

The R.A.F. Appointments and Gazettes will be found on page 536.

NAVAL.

MOVEMENTS OF SHIPS.

Port Said, Sept. 7th.—*Ark Royal* arrived and left.

A Hendon Reunion Dinner.

It is proposed to hold a Reunion Dinner early in October next for officers and ex-officers who served in the R.N.A.S. at Hendon, between Aug. 5th, 1914, and about Feb. 1st, 1915.

Will anyone interested please communicate with Flt. Lt. E. B. Beauman, H.Q. No. 10 Group, Lee-on-Solent, Hants, as soon as possible?

MILITARY.

EXTRACTED FROM WAR OFFICE COMMUNIQUES.

Sept. 8th.—On the Upper Euphrates the camps of a rebellious Sheikh were raided by our aeroplanes.

Insurgent camps near Istabulat were bombed and machine-gunned by our airmen on the 6th.

Sept. 9th.—Lower Euphrates.—Aeroplanes reconnoitring over Samawa were heavily fired on and replied with machine-gun fire. They succeeded in dropping medical supplies and money for the garrison, and also rations for the vessel *Green Fly*, which is isolated. . . .

An aeroplane raid has been made on a village 10 miles east of Nasiriyeh, where ringleaders of local insurgents were gathered.

Aerial reconnaissances along the Shatt-el-Hai report all quiet at Kut-el-Amara.

Sept. 14th.—Samawa Area.—Insurgents armed with home-made Turkish bombs made a feeble effort to cut the wire and storm the pickets on the night of Sept. 7th, and on the following night the main camp was subjected to sniping and bomb throwing. Samawa Town, where the insurgents are harboured, was raided by our aeroplanes on the morning of Sept. 9th.

Bakuba Area.—The 34th Brigade column, which left Baghdad on Sept. 6th, reached Abu Jisrah (50 miles) without opposition on Sept. 7th, repairing the railway and telegraph lines *en route*. Continuing their advance on the 8th. . . . .

The post left at Abu Jisrah was later attacked by 300 insurgents, who fled on the appearance of an aeroplane, which attacked them with bombs and machine-gun fire.

AIR FORCE.

An Air Ministry Conference.

It is understood that the Air Ministry will hold a conference during October. The conference will last three days. Representatives of many aeronautical and commercial interests will be present. Service, technical, and civil aeronautics will be discussed. The main object of the conference is to encourage the use of aircraft as a means of transport.

Victoria League Scholarships.

A gift of £1,500 having been generously put at the disposal of the Air Council by the Orange Free State Branch of the Victoria League for the permanent use of the Royal Air Force, it has been decided to apply this sum to the endowment of a number of scholarships tenable at the Royal Air Force (Cadet) College by the South African Flight Cadets and to be known as "Victoria League" Scholarships.

All candidates for admission to the Royal Air Force (Cadet) College whose fathers are British subjects of European descent and normally resident in the Union of South Africa will be eligible to compete for these scholarships.

Two scholarships will be offered for competition each year, one at the examination for admission to the Royal Air Force (Cadet) College held in June and one at that held in November.

The scholarships will be tenable for one year and will be of the annual value of approximately £35, payable half-yearly in arrear in equal instalments.

The scholarship on each occasion will be awarded to that one of the candidates fulfilling the conditions prescribed above, who successfully passes the competitive entrance examination with the highest number of marks and is selected for admission to the Royal Air Force (Cadet) College.

A "Victoria League" Scholarship may be held in addition to a King's or Prize Cadetship.

The names of intending candidates for these scholarships should be communicated to the Secretary (D.T.O.), Air Ministry, Kingsway, London, W.C.2, by whom they should be received not later than May 15th and October 15th for the examinations held in June and November respectively, and should be accompanied by a certificate of eligibility.

The tenure of a scholarship will be contingent on the good behaviour of the scholar, and the Air Council will have the power at their discretion to deprive a cadet of his scholarship in the event of serious misconduct. A cadet removed from the Royal Air Force (Cadet) College, for whatever reason, will automatically forfeit his scholarship from the date of his removal.

Wormwood Scrubs Airship Shed.

It is understood that the airship shed at Wormwood Scrubs is now being dismantled.

73rd Wing, R.A.F.

It is proposed to hold in London some time in October a re-union dinner of all officers who served under Yarmouth Command. Will all those interested communicate as soon as possible with either Mr. G. F. H. Bloom, 17, Welbeck Street, Mayfair, W.1, or Mr. Leonard Bridgman, care of THE AEROPLANE, 175, Piccadilly, W.1?

The R.N.A.S. and R.A.F. Felixstowe Dinner.

A reunion dinner will be held in the near future in London, open to all ranks, past and present, of the Felixstowe Air Station. Will all members interested kindly communicate with the Hon. Sec., W. Kilson, 22, Manor Terrace, Felixstowe?

To N.C.O. Pilots.

It has been suggested that a reunion dinner for N.C.O. pilots and observers shall be held later in the year. Past and present N.C.Os who would like to be present at such a union are invited to write to the Editor of THE AEROPLANE, who will be pleased to put them in touch with one another so that they may form a committee and elect a secretary to make necessary arrangements.

IRELAND.

The Irish Mails.

It is understood that all Government letters for Dungarvan, Co. Waterford, are now being carried by aeroplanes to barracks in which soldiers or police are quartered.

This method has been adopted in other parts of the country in which raids on mail trains and mail vans have become a common occurrence.

The Military mail which was being conveyed by air to Bantry, Co. Cork, was captured by Sinn Feiners on Sept. 11th. The Sinn Feiners, disguised in khaki uniforms, spread a large white circle in a field near Bantry, and the aviators, mistaking this for the official signal, dropped the mail-bags into the field. The Sinn Feiners took the mail, in motor-cars, in the direction of Kerry.

INDIA.

The North-West Frontier.

It is reported from Simla that aeroplanes have operated successfully in the Oghi region against hostile gatherings.

A later report states that Air Force activities in the Oghi district have now been suspended.

COLOMBIA.

Captain Guichard, of the Aviation Militaire Française, has been asked by the Colombian Government to form an aviation school at Bogota.

FRANCE.

Aeronautical Scholarships.

The system of aeronautical scholarships for the training of candidates for the aerial arm of the military forces are now in operation.

Selected pupils receive 1,000 francs on entry to cover the expenses of food and lodging and a further 1,000 francs when they pass the tests for the brevet militaire. During their training they are under the discipline of the civil aviation schools to which they are attached, and are not subject to any other military obligation than they would be normally according to their class. They undertake, however, to serve for ten years in the aeronautique militaire in the army and in the reserve.

At present 185 pupils are at the civil schools under the scholarship conditions. Hanriot at Reims has 29, Blériot at Buc and Morane-Saulnier at Villacoublay have each 24. Sixteen are with Nungesser at Orly, and Caudron at Crotoy, Farman at Toussus-le-Noble, and Balleyguier at Nimes have each 25.

Under the contract between the civil firms and the State, thirty pupils are to be supplied to each firm and arrangements are being made to complete these numbers.

The Re-baptism of L.72.

The Ministry of Marine have now obtained the Zeppelin L.72 under the terms of the Peace Treaty and have decided with promptitude to alter its German name. It has now been re-baptised D.R.1, which is the abbreviation for Dirigeable Rigid, Number 1.

A Curious Accident.

Quartermaster René d'Etienne, who crashed in a courtyard at Montrouge and killed four children and seriously injured a fifth, is lying in hospital apparently little the worse for his fall.

In flying low, during a stunting exhibition, he hit some telephone wires and fell among the children who had been watching his antics for some time. It has been reported that he will be tried by court-martial.

The accident has led to a strong demand for Parliamentary action. It appears that according to the present state of the law action, in cases such as this, can only be taken after accidents have occurred. A Bill has been introduced into the Chamber prohibiting flying over towns below a certain altitude, and anyone failing to comply with this will be liable to heavy fines and even imprisonment.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

NOTICE TO AIRMEN (No. 96 of the year 1920).

AIR MINISTRY, Sept. 9th.

PROHIBITED AREAS IN SWEDEN.

It is hereby notified:—

A Royal Decree, regarding air traffic over Swedish territory, was signed on May 23rd, 1919.

Paragraph 8 of the above Decree defines the prohibited areas as follows:—

"Without a personal licence granted by the Crown, after due application, aircraft shall not travel over the forbidden areas of the fortresses of Boden Hemsjo, Vaxholm, Karlsborg, or Karlskrona, over the forbidden area of the fortress of Alosborg east of the longitude and north of the latitude passing through Brunno Kummel, or over the land area east and north of the Lulea-Riksgransen Railway; nevertheless the forbidden area of the fortress of Vaxholm may be travelled over on a line passing through Badstuguholmen in Stora Vartan, Oranienholmen in Tralhavet, Bjornholmen in the Edofjarden, and finally Troskskar in the Svartlogafjarden, and the forbidden area of the fortress of Karlskrona along a line passing through Torhamnsudde, Salljo sodra udde (south point) Torko norra udde (north point) and finally Gjokalo, as well as along the railway line Eringsboda-Nattraby."

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

(Compiled by the Staff of THE AEROPLANE.*)*

SEPTEMBER 6th:

A.T.&T., DH9, G-EAPL, London-Paris, 09.35-11.45, Nil, 2, Powell.
A.T.&T., DH16, G-EASW, London-Paris, 09.35-11.47, M., 3, Holmes
A.T.&T., DH9, G-EAGY, London-Amsterdam, 10.40-13-17, G., 2, Reeves.
I.A.L., DH4, G-EAMU, London-Paris, 12.30-14.40, G., 2, Chattaway.
A.T.&T., DH9, G-EAQN, London-Amsterdam, 14.45-17.35, G., Nil, Hinchcliffe.
A.T.&T., DH16, G-EAPM, London-Paris, 16.30-18.50, G.&M., 3, Tebbitt.
A.T.&T., DH9, G-EAQP, London-Paris, 16.37-18.55, Nil, 2, Bradley.
A.T.&T., DH9, G-EAQN, Amsterdam-London, 15.40/4-09.30, Nil, Nil, Bamber.
A.T.&T., DH9, G-EAQP, Paris-London, 10.00-12.32, Nil, 1, Tebbitt.
C.T., Nieuport, F-CGTE, Paris-London, 12.30-16.27, M., Nil, Petit.
C.desG.E.A., Goliath, F-GEAD, Paris-London, 12.40-16.48, G., 7, Favreau & 1.
A.T.&T., DH16, G-EAPT, Paris-London, 12.35-15.27, G., 3, Lines.
A.T.&T., DH9, G-EAQL, Amsterdam-London, 15.33-19.07, G.&M., 1, Milnes
A.T.&T. DH16, G-EASW, Paris-London, 16.35-19.53, G., 2, Holmes.

SEPTEMBER 7th:

A.T.&T., DH16, G-EAPT, London-Paris, 09.35-11.50, G.&M., 2, Lines.
A.T.&T., DH9, G-EAQL, London-Amsterdam, 10.18-13.30, G., Nil, Bamber
C.T., Nieuport, F-CGTE, London-Paris, 14.00-16.35, Nil, Nil, Petit.
A.T.&T., DH16, G-EASW, London-Paris, 16.38-19.00, G.&M., 2, Armstrong.
A.T.&T., DH16, G-EAPM, Paris-London, 09.50-12.07, G., 2, Bradley.
I.A.L., DH4, G-EAMU, Paris-London, 12.25-14.48, G., 2, Chattaway.
M.A., Breguet, F-CMAB, Paris-London, 12.30-15.39, G.&M., 1, Martel.
A.T.&T., DH9, G-EAGY, Amsterdam-London, 15.15-17.25, M., 1, Reeves
A.T.&T., DH18, G-EARO, Paris-London, 15.30-17.51, G., 1, Powell.
A.T.&T., DH9, G-EAPL, Paris-London, 16.00-18.35, Nil, 2, Carter.
A.T.&T., DH16, G-EAPT, Paris-London, 16.05-18.25, Nil, 3, Tebbitt.
A.T.&T., DH9, G-EAQP, Paris-London, 16.25-18.58, Nil, 2, Lines.

SEPTEMBER 8th:

A.T.&T., DH9, G-EAPL, London-Paris, 09.40-12.20, G., 1, Milnes.
A.T.&T., DH16, G-EAPT, London-Paris, 09.55-12.10, G.&M., 4, Holmes.
A.T.&T., DH9, G-EAGY, London-Amsterdam, 11.25-14.19, G., 1, Bradley.
C.desG.E.A., Goliath, F-GEAD, London-Paris, 11.34-15.05, G., Nil, Favreau & 1.
M.A., Breguet, F-CMAB, London-Paris, 13.45-15.10, Nil, Nil, Martel.
A.T.&T., DH16, G-EAPM, London-Brussels, 15.00-17.20, G., 4, Reeves.
A.T.&T., DH9, G-EAQP, London-Amsterdam, 15.04-18.10, G., Nil, Carter
M.A., Salmson, F-CMAE, London-Paris, 15.10-18.30, Nil, 1, Chailloux.
A.T.&T., DH16, G-EASW, London-Paris, 16.34-18.45, G.&M., 3, Tebbitt.
A.T.&T., DH16, G-EASW, Paris-London, 09.50-12.10, G., 3, Armstrong.
C.desG.E.A., Goliath, F-GEAB, Paris-London, 12.15-15.30, G., 3, Patin & 1
C.T., Nieuport, F-ICGT, Paris-London, 12.20-15.15, M., Nil, Mauler.
A.T.&T., DH9, G-EAQL, Amsterdam-London, 15.21-18.30, G.&M., 1, Bamber.
A.T.&T., DH16, G-EAPT, Paris-London, 16.10-18.45, G., 2, Holmes.
A.T.&T., DH16, G-EAPM, Brussels-London, 18.20-09.50/9th, Nil, Nil, Reeves,

SEPTEMBER 9th:

A.T.&T., DH18, G-EARO, London-Paris, 09.45-12.25, G.&M., 5, Powell.
A.T.&T., DH9, G-EAQL, London-Amsterdam, 10.25-13.57, G., Nil, Lines.
C.T., Nieuport, F-ICGT, London-Paris, 13.00—, Nil, Nil, Mauler.
A.T.&T., DH9, G-EAQA, London-Paris, 13.25-16.00, G., 2, Robbins.
A.T.&T., DH9, G-EAPL, London-Paris, 16.42-19.10, Nil, 2, Milnes.
A.T.&T., DH16, G-EAPM, London-Paris, 16.52-19.15, G.&M., 3, Holmes
A.T.&T., DH16, G-EASW, Paris-London, 09.40-11.45, Nil, 3, Tebbitt.
A.T.&T., DH9, G-EAPL, Paris-London, 09.50-12.10, Nil, 1, Milnes.
A.T.&T., DH9, G-EAQP, Amsterdam-London, 15.14-18.28, G.&M., 1, Carter.
A.T.&T., DH18, G-EARO, Paris-London, 16.40-18.49, G., 5, Powell.

SEPTEMBER 10th:

A.T.&T., DH18, G-EAUF, London-Paris, 11.04-13.25, G.&M., 6, Armstrong
C.desG.E.A., Goliath, F-GEAB, London-Paris, 11.34-14.30, G., 3, Patin & 1
A.T.&T., DH9, G-EAQP, London-Amsterdam, 11.37-14.52, G., Nil, Reeves
A.T.&T., DH16, G-EASW, London-Paris, 16.35—, Nil, 4, Tebbitt.
A.T.&T., DH16, G-EAPM, London-Paris, 17.00-19.05, G.&M., 3, Robbins.
A.T.&T., DH9, G-EAQA, Paris-London, 10.15-12.55, Nil, 1, Milnes.
A.T.&T., DH16, G-EAPM, Paris-London, 10.15-12.50, Nil, 3, Robbins.
C.desG.E.A., Goliath, F-HMFU, Paris-London, 11.30-15.20, G., Nil, Favreau & 1.
C.T., Nieuport, F-CGTO, Paris-London, 12.35-16.42, M., Nil, Le Comte.
A.T.&T., DH19, G-EAPL, Paris-London, 13.30-15.55, Nil, 1, Holmes.
A.T.&T., DH9, G-EAQL, Amsterdam-London, 15.35-19.00, M., 2, Lines.
A.T.&T., DH18, G-EAUF, Paris-London, 16.45-19.15, G., 1, Armstrong.

SEPTEMBER 11th:

A.T.&T., DH9, G-EAQL, London-Amsterdam, 10.30-13.43, G., 1, Milnes.
A.T.&T., DH18, G-EAUF, London-Paris, 10.30-13.15, G.&M., 5, Powell.
A.T.&T., DH9, G-EAPL, London-Amsterdam, 11.25-14.13, G., Nil, Holmes
C.T., Nieuport, F-CGTO, London-Paris, 11.35-16.10, Nil, Nil, Le Comte.
A.T.&T., DH9, G-EAQA, London-Paris, 16.11-18.55, G., Nil, Carter.
A.T.&T., DH16, G-EAPT, London-Paris, 16.32-18.55, Nil, 4, Lines.
A.T.&T., DH16, G-EAPM, London-Paris, 16.34-18.55, G.&M., 3, Tebbitt.
A.T.&T., DH16, G-EAPM, Paris-London, 09.40-11.40, G., 1, Tebbitt.
M.A., Breguet, F-CMAI, Paris-London, 13.00-15.39, G.&M., Nil, Lesec.
A.T.&T., DH9, G-EAPL, Amsterdam-London, 15.22-17.57, G.&M., 1, Reeves

SEPTEMBER 12th:

A.T.&T., DH18, G-EARO, London-Paris, 10.20-12.55, Nil, 6, Armstrong.
C.desG.E.A., Goliath, F-GEAC, London-Paris, 12.40-16.15, Nil, Nil, Patin & 1.
A.T.&T., DH9, G-EAPL, London-Paris, 15.17-17.30, Nil, 1, Reeves.
A.T.&T., DH16, G-EASW, Paris-London, 10.05-12.10, Nil, 3, Robbins.
A.T.&T., DH16, G-EAPT, Paris-London, 10.10-12.11, Nil, 3, Tebbitt.
A.T.&T., DH18, G-EAUF, Paris-London, 10.35-12.46, Nil, 7, Powell.
A.T.&T., DH16, G-EAPM, Paris-London, 11.10-13.15, Nil, 2, Lines.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

(Compiled from Log of Cricklewood Aerodrome. Times on the Continent from Air Ministry Communiques.)

SEPTEMBER 6th:

H.P.T., HP, G-EASN, London-Paris, 09.35—, Nil, 5, McN. Davies & 1.
H.P.T., HP, G-EATN, London-Paris, 12.10-15.00, G., 7, Bager & 1.
H.P.T., DH9, G-EAUP, London-Brussels, 14.53—, G.&M., 2, Moore.
H.P.T., DH9, G-EAUN, Amsterdam-London, 11.55-16.00, M., Nil, Hill.
H.P.T., HP, G-EALX, Paris-London, 12.40-16.55, M., 5, Wilcockson & 1.
H.P.T., DH9, G-EATA, London-Amsterdam, 17.10—, G.&M., Nil, Perry.
S.N.E.T.A., DH4, O-BADO, Brussels-London, —17.25, M., 1, Semonet.

SEPTEMBER 7th:

H.P.T., HP, G-EALX, London-Paris, 12.15-15.40, G., 10, Jones & 1.
H.P.T., DH9, G-EATA, Amsterdam-London, —14.30, G.&M., Nil, Perry.
H.P., DH4, O-13, London-Brussels, 14.45—, Nil, 1, Fowler.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 14.53—, G.&M., 1, Semonet.
H.P.T., HP, G-EATG, Paris-London, 12.10-15.47, Nil, 3, Olley & 2.
H.P.T., DH9, G-EAUN, London-Amsterdam, 16.18—, G.&M., Nil, Rogers.
H.P.T., DH9, G-EAUP, Brussels-London, 15.00-17.45, M., 2, Moore.

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SEPTEMBER 8th:

H.P.T., DH9, G-EAUN, Amsterdam-London, —11 12, G.&M., 1, Rogers.
H.P.T., HP, G-EATH, London-Paris, 12.03-15.20, G., 9, Bager & 1.
H.P.T., DH9, G-EATA, London-Brussels, 14.42-17.15, G.&M., Nil, Olley.
H.P.T., HP, G-EALX, Paris-London, 12.21-15.40, G., 3, Jones & 1.
H.P.T., DH9, G-EAUN, London-Amsterdam, 16 16—, G.&M., 1, Moore.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 14 50-18.15, M., 2, Semonet.

SEPTEMBER 9th:

H.P., DH4, O-6, London-Brussels, 11.20 Landed Merx Plas, Nil, Nil, Wilcockson.
H.P.T., HP, G-EATM, London-Paris, 12.07-15.30, G., 5, Beal & 1.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 14.42-19.20, M., 2, Semonet.
H.P.T., DH9, G-EAUN, Amsterdam-London, —14 50, M., Nil, Moore.
H.P.T., DH9, G-EAUN, London-Amsterdam, 17.15—, G.&M., Nil, Fowler.
M.A., Spad, F-CMAW, Paris-London, —16.35, G.&M., Nil, Bourdon.
H.P.T., HP, G-EATH, Paris-London, 12.30-16.42, G., 5, McN. Davies & 1.
H.P.T., DH9, G-EATA, Brussels-London, —17 00, G.&M., 2, Olley.

SEPTEMBER 10th:

H.P.T., HP, G-EATH, London-Paris, 12.21-15.15, Nil, 9, Jones and 1.
H.P.T., HP, G-EATK, London-Paris, 12.25-15.15, G., 6, Olley & 1
H.P.T., DH9, G-EAUN, Amsterdam-London, —11.50, G.&M., 1, Fowler.
M.A., Spad, F-CMAW, London-Paris, 14.25-16.45, Nil, 1, Bourdon.
H.P.T., DH9, G-EAUP, London-Brussels, 14.42-16.45, G.&M., 1, Rogers.
H.P.T., DH9, G-EATA, London-Amsterdam, 16.15— G.&M., 1, Hill.
H.P.T., HP, G-EATN, Paris-London, 12.40-16.15, Nil, 7, McIntosh & 1.
H.P.T., HP, G-EATM, Paris-London, 12.30-16.17, Nil, 9, Beal & 1.
H.P.T., HP, G-EASN, Paris-London, 12.45-17.12, G, 5, Bager & 1.
S.N.E.T.A., DH4, O-BABI, Brussels-London, 14.40-17.30, M., Nil, George.

SEPTEMBER 11th:

H.P.T., HP, G-EATG, London-Paris, 12.20-16.00, G., 5, McIntosh & 1.
H.P.T., HP, G-EASY, London-Paris, 12.28-16.20, Nil, 5, Bager & 1.
S.N.E.T.A., Breguet, O-BLOC, London-Brussels, 12.25—, Nil, Nil, Verger.
S.N.E.T.A., DH4, O-BABI, London-Brussels, 14.30-16 35, M., Nil, George.
H.P.T., HP, G-EATK, Paris-London, 12.30-15.25, Nil, 3, Olley & 1.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 17.20—, G.&M., 2, Foot.
H.P.T., DH9, G-EATA, Amsterdam-London, 12.51-17.05, G.&M., 1, Hill.
H.P.T., DH9, G-EAUP, Brussels-London, 14.55-17.15, M., Nil, Rogers.

SEPTEMBER 12th:

H.P.T., DH9, G-EAUI, London-Brussels (for Bucharest), 08.35—, Nil, 1, Perry.
H.P.T., HP, G-EALX, London-Paris, 12.10-15.45, G., 4, Beal & 1.
H.P.T., HP, G-EATH, Paris-London, 12.10-15.20, Nil, 5, Jones & 1.

Inland Flying at Croydon.

Sept. 6th.—A.T.T., D.H.9, one test.

Sept. 7th.—Nil.

Sept. 8th.—A.T.T., D.H.9, one joyride M.W.T. Co., D.H.6, one wireless test. I.A.L., D.H.4, Brooklands return. M.A., Salmson, test. R.A.F., Bristol, Kenley return.

Sept. 9th.—A.T.T., D.H.9, two joyrides.

Sept. 10th.—A.T.T., D.H.18, two tests; D.H.16, one joyride; D.H.9, one test; D.H.9, Lincoln return. M.W.T. Co., D.H.6, two wireless tests.

Sept. 11th.—M.W.T.C., D.H.6, one wireless test. A.T.T., D.H.9, test; D.H.9, two joy-rides; D.H.18, two tests. I.A.L., D.H.4, photography. H.P.T., D.H.9, Cricklewood return. A.P.B., Westland from Yeovil, Courtney.

Sept. 12th.—A.P.B., Westland test.

Inland Flying at Cricklewood.

Sept. 6th.—H.P.T.: D.H.9 from Lympne. H.P.: D.H.4, test.

Sept. 7th.—H.P.: D.H.4, test; Handley Page, test. H.P.T.: D.H.9, test.

Sept. 8th.—H.P.: D.H.4, 2 tests; H.P.T.: 3 Handley Page tests, 1 D.H.9 test.

Sept. 9th.—H.P.T.: 2 Handley Page tests. D.H.9 test. S.N.E.T.A.: Breguet from Penshurst

Sept. 10th.—M.A.: Spad test. H.P.: D.H.4 test H.P.T.: 2 D.H.4 tests, 1 Handley Page test. Handley Page from Lympne.

Sept. 11th.—Private: Hearn, Avro from Birmingham. H.P.T.: Handley Page test; D H.9 to Waddon, return; D.H.9 to Manston.

Sept. 12th.—Hearn, Avro test. H.P.T.: D.H.9 from Manston.

The London Terminal Aerodrome.

Owing to overcrowding in the permanent hangars, the C.A.T.O. has now arranged for the erection of some Bessoneaux.

A Westland for the Air Post of Banks (called by the unbelieving and the heathen "Hot Air Bags") arrived on Saturday, piloted by Mr. Frank Courtney, who tells one that he intends landing commercial machines the right way up, as, for some inexplicable reason, the passengers seem to prefer it. Mr. Powell took the machine for a test on Sunday, and Mr. Courtney inaugurated the Paris service on Monday by starting off at 12.17 with two passengers. More machines for the service are expected immediately. The machine is fitted with a 275-h.p. "Falcon" Rolls-Royce, but it is intended to fit the majority of machines with 300-h.p. Hispano-Suizas.

On Saturday there was a big crowd of spectators, who had plenty of value for the money they do not pay to watch. One is glad to say that in this free enclosure there is a good response to the appeal for funds to support the Purley Hospital, to which victims of a crash (if ever there is one, and there *are* railway accidents now and then) will be taken.—G. D.

A.T. and T. Notes.

It is interesting to note that, while the number of machines crossing is still about the same, the number of passengers shows considerable increase. This is due to the number of D.H.16s and D.H.18s now being used.

The D.H.18 is really a delightful machine. One had the pleasure of a flight in it on Saturday evening. One is rather apt to over-enthuse when flying in any new type of machine, but the "18" deserves all the nice things that have ever been said about any machine—and a great deal more as well. It is comfortable and the amount of daylight in the cabin is unusual. A perfect view is obtained on both sides—in fact it is no exaggeration to say that the view is as good as that obtained from most open machines.

The smooth running of the Napier engine was quite extraordinary even when throttled down, and, when some designer comes along with a machine with a practicable high-lift wing there should be a huge demand for this splendid engine.

Mr. Armstrong's handling of the D.H.18 is beyond reproach.

During the week an American lady booked a special D.H.9 to Lincoln to visit the tomb of one of her ancestors who missed the *Mayflower*. One man came from Paris on business with a through ticket to Amsterdam. He remarked in course of conversation that he really wanted to go on to Copenhagen. A machine was at once forthcoming and, with Mr. Bradley as pilot, he completed the journey to Copenhagen without incident.

On Saturday a perfectly good German arrived from Rotterdam and was duly let loose in England after consultation with the Foreign Office.

It is satisfactory to note that A.T. and T. are now running their services at a profit.—G. D.

The Instone Air Line.

The D.H.4 went to Paris during the week, also to Brooklands. "Litt—" (as one was!), the Vickers "Vimy" surnamed "City of London," has been having her engines overhauled and new cylinders fitted during the week.

The Instone office is now painted with black and white stripes. One suggests that the company should now purchase the striped machine shown at Olympia by the Central Aircraft Company to match the office.

One is asked to state for the benefit of the ignorant that "hurtling into the *Ewigkeit*" does not mean running into the Aircraft Disposal Company's sheds.—G. D.

A Long Flight.

On Sunday last an H.P.T. D.H.9, with Mr. Perry, one of the most experienced of late warrant-officer R.A.F. pilots, started for Bucharest with a business man, Mr. Wright, as passenger. They reached Nuremburg by the evening and were proceeding next day. No further news is to hand.—G. D.

A Businesslike Actor.

One is told that Mr. Lionel Westlake, the well-known actor, now playing *Pebe* in *The Romantic Young Lady* at the Royalty, had to go to Paris on urgent business and had to be back in the afternoon for a rehearsal. This enterprising young man therefore decided to catch the morning machine across and return by the first available in the afternoon. He transacted his business and was back in London by tea time.—G. D.

An Accident.

A D.H.9 (G-EAUP), belonging to Handley Page Transport, and piloted by Mr. Olley, who was carrying Miss Margaret Balfour, a concert singer, to fulfil an engagement, had a forced landing at Carnforth and was damaged. Neither pilot nor passenger sustained serious injury.

Mr. Olley is a very experienced pilot, and has had forced landings before, without damage, in almost impossible places. This is his first accident during his employment with Handley Page Transport, Ltd.—G. D.

(*Continued on page* 531.)

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THE WEEKLY COMMENTARY.

The third of the series of articles on the History of the Development of Aircraft Wireless appears below.

The very important developments which sprang from the introduction of the Thermionic valve as a detector and amplifier of wireless signals, and as a producer of continuous wireless waves, are outlined therein.

On page 520 there is reproduced an officially compiled table giving particulars of the machines which were tested at Martlesham during the Air Ministry Competition for aeroplanes, together with the results of the tests there carried out.

Illustrations and descriptions of some German seaplanes of considerable interest are given by Mr. Hildesheim in this issue. It will be news to many that the German Naval Yards of Danzig and Wilhelmshaven had fulfilled functions somewhat analogous to those which Felixstowe and the Isle of Grain performed for the Naval branch of the British Air Service.

The Department of Civil Aviation has begun the publication of a series of notices to civilian ground engineers. The first instalment of these appears on page 528 of this issue.

A statement concerning the formation of an Institute of Transport will be found on page 526. It is an interesting fact that among the list of those whose names appear as Members of the Council there is none to be found representing aerial transport.

Is this an indication that the Transport industry knows nothing of aviation or that aviation knows nothing of Transport?

THE HISTORY OF THE DEVELOPMENT OF AIRCRAFT WIRELESS.

III.—The Later Stages of the War.

The Thermionic Valve.

The dawn of 1916 witnessed the commencement of a period of fruitful activity in the world of aircraft wireless. Throughout the previous year a great deal of useful work had been done in connection with the development of the "thermionic" valve as an amplifier of spark signals. In fact, two such valves—the "Round" and the "Audion"—had already been used with considerable success on special ground stations, but the individual demerits of each were such as to preclude their adoption in standard apparatus for aircraft use.

The "Round" valve was so essentially "sensitive" that its operation demanded the supervision of highly-trained expert operators in order to secure the degree of efficiency that warranted its use even on ground stations. The average efficiency of the "Audion," on the other hand, did not yield nearly such good results as the "Round" valve when working at its best. Also, at this time, manufacturers had had so little experience in making valves of any kind that the greatest discrepancies were frequently found to exist amongst valves of the same standard design.

It might here be mentioned that a valve is called a valve because it allows current to be passed through it in one direction only.

In the earlier months of this year the French evolved an efficient valve, which our own experts tested and examined carefully and found to be an eminently satisfactory article, both from the point of view of sensitivity and ease of operation. It immediately rivalled the "Round" valve, and eventually replaced it altogether in the Services, becoming, in fact, the model on which practically all the valves subseqeuntly employed in the R.A.F. were designed.

It was now fully realised that the three-electrode valve was going to revolutionise all previous methods of wireless communication. As a rectifier it would replace the crystal, as an amplifier it was many times more efficient than the Brown's Relay, and as a transmitter of continuous waves it was far more economical of power than any spark or arc system of transmission yet used.

The First Valve Receiving Set.

The first valve-receiving set to be designed was composed of a single "Audion" valve and a Brown's Relay (described in previous article of this series). This was called the Relay Type Ta. Exhaustive experiments were also conducted with various combinations of valves in "cascade," with a view to evolving a completely independent valve receiver.

The Tb. Relay.

Before this was finally accomplished, however, a second and more efficient valve relay was produced and adopted towards the close of the summer of 1916. This instrument, which was called the Relay Model Tb., was specially designed as a substitute for Brown's Relay, and could therefore be used in conjunction with the Tb, Tc or Td crystal receivers referred to in previous articles. Fig. 1 shows the internal connections of this valve relay.

Three French-pattern valves are used in "cascade" which function as a combined amplifier. In other words, the incoming signals are received and rectified by the particular crystal receiver employed (Tb, Tc or Td). On leaving the receiver they enter the first valve at the points L and E in Fig. 1, and are here subjected to the first stage of amplification. From the first valve they are conveyed, *via* the inter-valve transformer A, to the second valve, where a further amplification is effected, and thence through the inter-valve transformer B to the third valve for the final amplification.

From the third valve the signals are conducted through the telephone transformer C to the telephones, which are connected at the point T in diagram. The valve filaments are lit by a common 6-volt battery, and, normally, consume a current of about 0.73 ampéres each. Amplification is found to diminish considerably if a current of more than 0.85 ampéres is used.

As will be seen from Fig. 1, the high-tension battery of 100-volts is shunted by a condenser of 0.3 mfds. and "Eureka" wire resistance of 2,000 ohms. The function of the former is to provide a short-circuit path for low-frequency oscillations, and prevents "howling" in the telephones in the event of a high-tension cell becoming run down. The function of the resistance wire is merely to prevent too great a discharge in the event of the battery becoming accidentally short-circuited.

Air-Driven Generators.

About this time, also, a number of incidental developments were in progress. Attempts were made to develop a standard air-driven generator which could be mounted on the struts or side of a machine and derive its original energy from the wind blast of the propeller; the greatest difficulty was experienced in designing a suitable propeller for these instru-

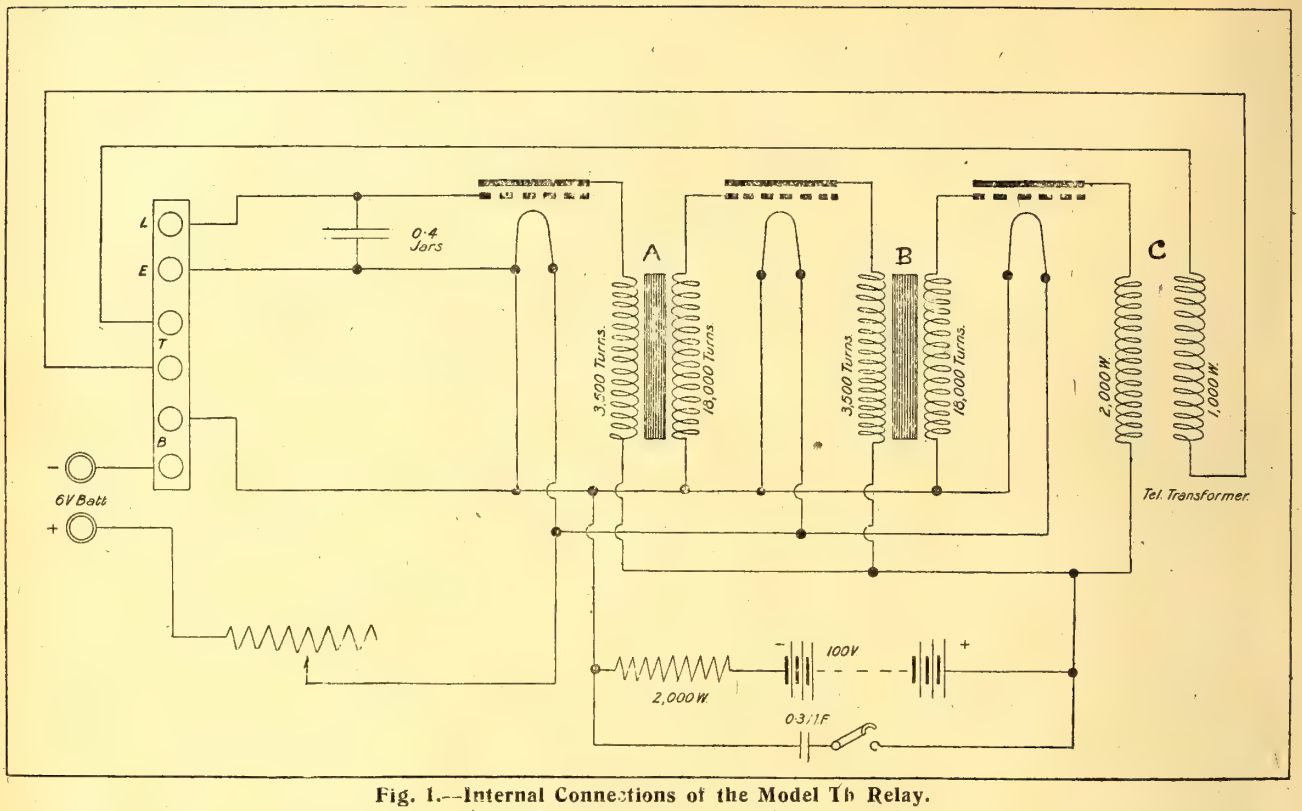


Fig. 1.—Internal Connections of the Model Tb Relay.

ments. Subsequently, the Newton and the B.T.H. generators were adopted as more or less standard equipment.

Magneto Noises.

Another field for investigation was afforded in connection with the elimination of magneto noises, which were due to currents induced into the receiver and amplified in the telephones, when the engines were running and the magneto functioning. This problem was never seriously tackled until very late in the war, and, although different devices for preventing magneto interference were employed with varying success on some of the latest pattern valve receivers, the difficulty had not been effectively overcome up to the time of the Armistice.

Novel ideas were constantly submitted for the design of improved forms of aerial reels for standard use. Serious effort was also devoted to the development of intercommunication telephone for connecting the pilot and passengers in the same machine. In the midst of all this activity, the main energies at home were applied to the development of standard valve receiver and transmitters—both for telegraphy and telephony.

The Valve Transmitter.

During the spring of 1916 the first valve transmitter was introduced by Captain Round, R.E. (designer of the "Round" valve), and excellent results were obtained from a test carried out on an S.S. airship at Wormwood Scrubs, London, on which occasion the signals were heard at the Royal Naval Air Station, Aberdeen. This set contained one "Round" valve, and was tuned to a wave-length of 1,200 metres. A high-tension of 1,000 volts was supplied by dozens of small, dry batteries grouped in boxes, which brought the total weight of the equipment to about 120 lbs.

Although this apparatus represented an important step forward in the development of Continuous Wave (C.W.) transmitters, it was not sufficiently reliable for standard use. It supplied a great stimulus to experiment and research, however, in connection with the unrevealed potentialities of the valve. About six months later another valve transmitter was evolved, which employed two "Oscillion" valves, and was called the Type 56a. This instrument was intended mainly for use in airships, and yielded fairly satisfactory results.

Early Weaknesses.

It was only to be expected that these earlier types of valve receivers and transmitters should possess many inherent weaknesses which prevented them from being employed for long as standard equipment. New discoveries were being recorded daily in connection with the wonderful achievements of valves, and one instrument quickly superseded another whilst the earlier investigations were in progress. The first valve receiver to warrant itself worthy of general and permanent adoption for use in aircraft was the Tf receiver. This instrument comprises three French-pattern valves and functions as a rectifier and amplifier combined; its efficiency may be judged from the fact that it is still in use in the Royal Air Force.

Some months after the Tf receiver was designed, a new two-valve transmitter was subjected to its first test. This was the transmitter T57, which eventually became a standard aircraft instrument.

Direction Finding Difficulties.

In the early part of 1917 great efforts were made to adapt existing methods of "direction-finding" wireless to aircraft conditions, and experiments were carried out with a view to combining directional aerials with the Tf receiver. Although the Tf, however, had proved its efficiency as an ordinary aircraft spark and C.W. receiver, it was soon realised that it was quite unsuited for reception in connection with direction-finding work.

This was due to the fact that, with the Tf, the greatest sensitivity was only obtained by bringing the valves to the "oscillation point," which had the effect of reducing the notes of all received signals to the same pitch. Such a condition is particularly to be avoided in direction-finding work, which demands as marked a distinction as possible between the pitch of individual signals, in order to permit of easy recognition of the special transmitting stations used for this purpose. A special amplifier, employing seven valves, was subsequently designed, which gave the highest satisfaction as a receiver for use in conjunction with the direction-finding apparatus which will be described in the next article.

Whilst these developments were taking place, the fusion of the R.N.A.S. and the R.F.C. occurred, and the overseas wireless personnel of both Services were more than justifying the efforts being made at home to supply them with the best possible apparatus. The Germans had by this time begun to realise the efficiency of the British wireless systems in every sphere of operation, and were forced to employ some of their high-power stations to interfere with our activities by "jamming."

German Efforts at Jamming.

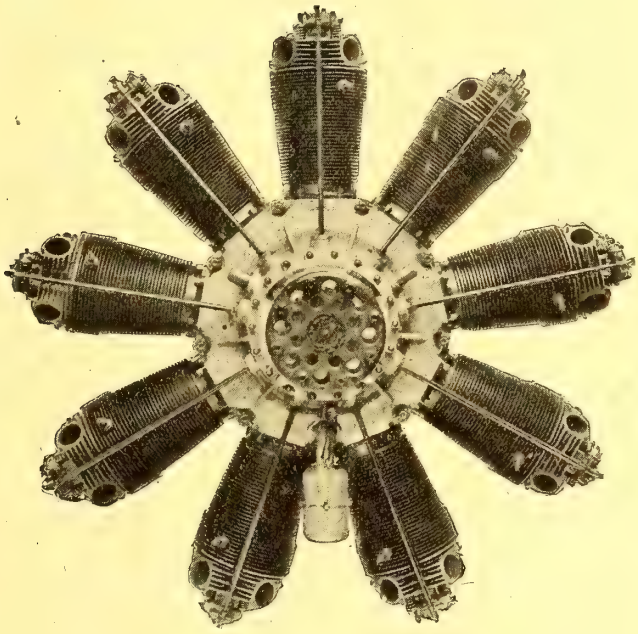
So far as this system of jamming effected the excellent work done by our observers in spotting for our guns on land, and on the monitors off the coast, the method operated as follows: When one of our batteries opened fire, a German machine was sent aloft to watch for the fall of the shell. As soon as this was observed, the enemy machine informed the enemy high-power transmitting station, who thereupon jammed the "spot" from our machine to the battery! Our observers soon became "wise" to this, however, and subsequent spotting operations usually developed into a race between the two observers to get their signals away first—in a flash—after the fall of the shell.

Although our observers at once proved themselves the masters at this game, the continual jamming of the German high-power stations was a source of inconvenience with which

THE

"Bristol"

400 h.p. JUPITER AERO ENGINE.



Weight:—The ungeared and geared types of JUPITER Engine weigh respectively 698 lbs. and 805 lbs., a reduction in weight never previously attained in any other type.

Performance:—The following excellent performances were registered by the JUPITER Engine when fitted to a "BRISTOL" Badger Biplane:—

Total weight of machine, including pilot, passenger, full military load, two machine guns, etc.	2800 lb.
Engine revs. on ground	1550 r.p.m.
Average revs. when climbing at 80 m.p.h. ...	1600 r.p.m.
Revs. flying level at 7000 ft. at 125 m.p.h. ...	1850 r.p.m.

(After correction of the Air Speed Indicator figures for density this gives 137 m.p.h. at 7000 ft.)

Climbing times were 2000 ft. in 1 min. 4 secs., 4000 ft. in 2 min. 10 secs., 6000 ft. in 2 min. 33 secs., 7000 ft. in 4 min. 15 secs.

Special Features:—Important patents are incorporated in the JUPITER Engines, more especially in connection with the induction system and with the master rod construction.

THE

BRISTOL AEROPLANE COMPANY, LTD.,

Telegrams: "Aviation," Bristol.

DESIGNERS AND CONSTRUCTORS OF AIRCRAFT AND AERO ENGINES.

Telephone: 3906 *Bristol.*

FILTON——————BRISTOL.

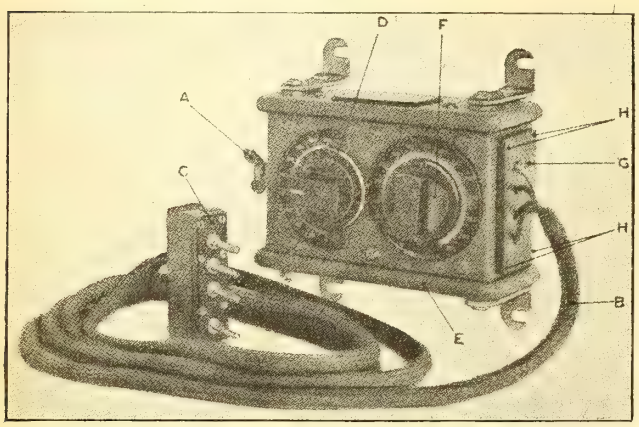


Fig. 2.—The Remote Control.

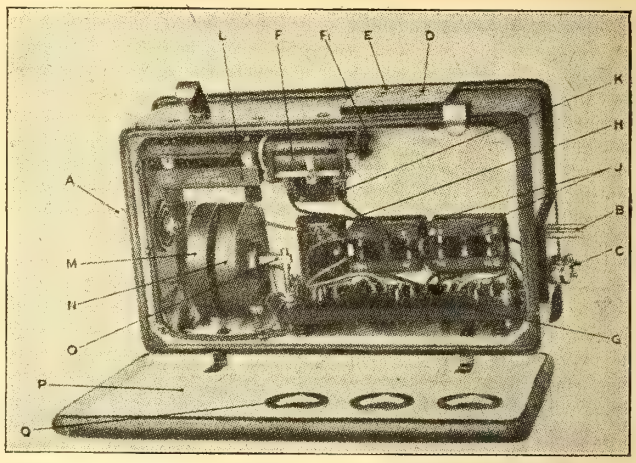


Fig. 4.—The Mk. II Wireless Telephone Receiver.

we would willingly have dispensed. It was not without its value, however, in providing the experimental staffs at home with an additional stimulus to evolve a suitable C.W. transmitter. The earliest experiments with valves had given ample evidence that one of the most valuable characteristics of valve transmitters of the future would be their great "selectivity." In other words, continuous waves could be so finely tuned that the possibility of jamming them would be reduced considerably.

Aircraft Telephony Progress.

In a previous article a passing reference was made to very valuable and practical research work that was begun in connection with aircraft wireless telephony as soon as possibilities of the three-electrode valve were first appreciated. Towards the end of 1917 these investigations led to the design of a standard telephony equipment known as the Telephone Wireless Aircraft Mk. II. This apparatus included a receiving and a transmitting set, also a "remote control" attachment (see Fig. 2), whereby the Tuner Aircraft Mk. III (which comprised the main portion of the receiving set) could be fixed in a remote part of the machine and operated by the special control device from the observer's or pilot's cockpit.

The Mark II Telephone Receiver.

Fig. 3 shows the internal connections of the tuner (which operates on three valves) and the control attachment, whilst Fig. 4 shows the arrangements of the various constituents of these units, the valves being temporarily withdrawn. (The letters used in Figs. 2, 3 and 4 do not correspond.) Referring to Fig. 3, the tuning of the aerial-earth circuit is effected by means of two fixed inductances F and H, and two variable condensers E and E_1. A suitable reaction coil G is inductively coupled (with a fixed coupling) to the coil F in a square ebonite box. This box is made detachable, in order that special coils can be included for particular wave-lengths. The set was usually operated on a 400 metre wave-length, although units for 700 metres were also available.

The detector circuit comprises an aperiodic coil J, which is inductively connected by a sliding coupling to the coil H in the tuned circuit already referred to. This aperiodic coil is connected at one end to the negative of the filament of the first valve, and at the other, to the grid of the same valve through a small condenser M of 0.00015 mfds., which is shunted by a resistance of between 500,000 and 600,000 ohms.

The other two valves are merely for amplifying the audio-frequency, and are connected in the usual manner. The value of the high-tension that gave the least results was usually found to be in the neighbourhood of about 40 volts, the plate current consumption being approximately 3.5 milliampéres for the three valves. The total current consumption of the three valve-filaments is 2.1 ampéres.

The plate circuit of the first valve acts as a reacting circuit, and this increases the strength of signals as the filament is brightened and the valve approaches oscillation point, this being affected by means of the resistances R^1 and R^3 in the control box. This set can also be adjusted for reception of continuous waves. Such reception, however, cannot be carried out by the heterodyne or "beat" method and the process of rectification is not satisfactory.

In the next article the transmitting apparatus of this equipment will be described, and also a brief account given of the development of direction-finding and aerial navigation by wireless.

M. B. E.

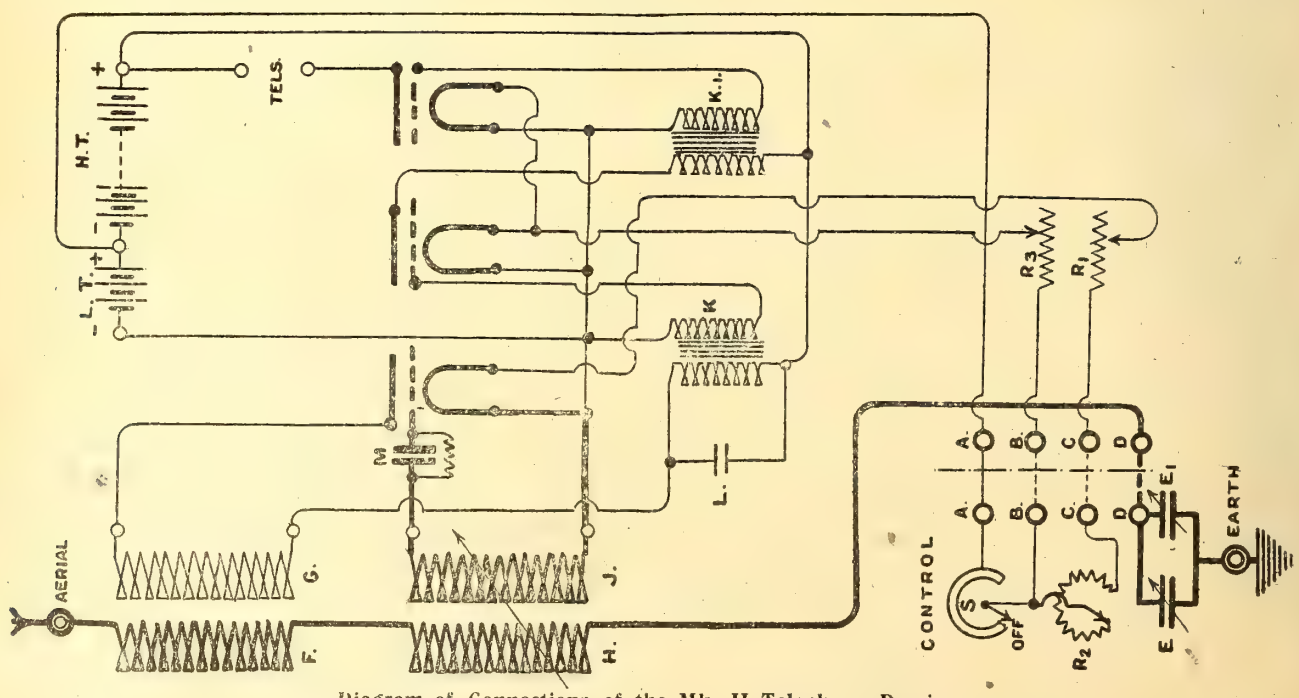


Diagram of Connections of the Mk. II Telephone Receiver.

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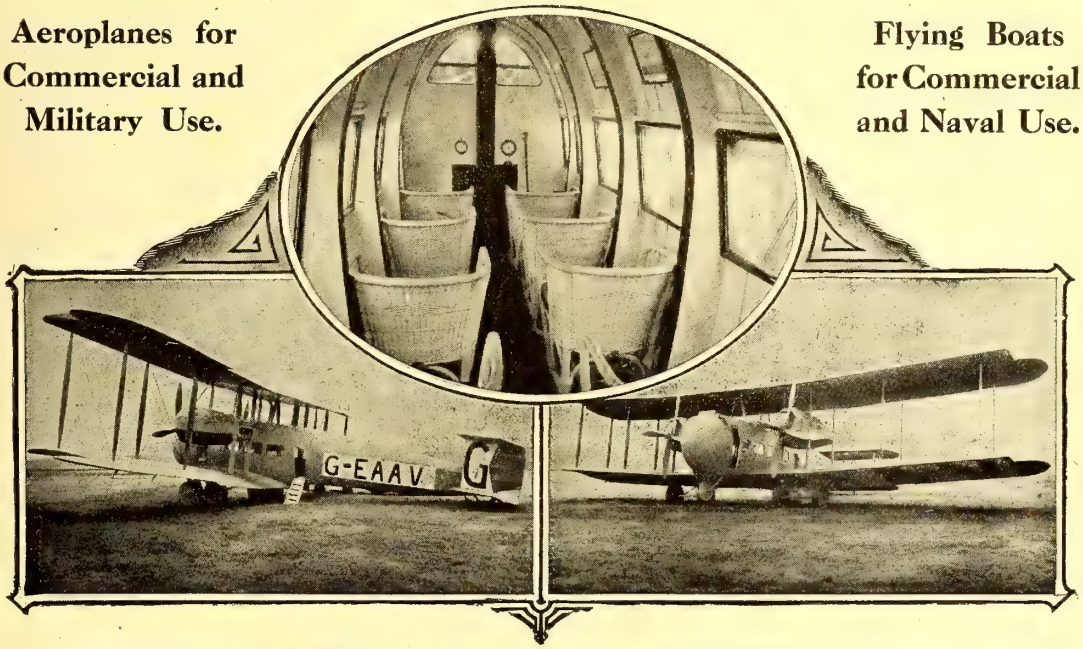

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1 Pilot and 11 Passengers or 1½ Tons of Mail or Freight. Endurance 5 hours.

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THE AIR MINISTRY COMPETITIONS, 1920.

TABLE OF DATA REGARDING THE LARGE AND SMALL AEROPLANES ARRANGED ALPHABETICALLY IN EACH CLASS.

Name.	Horse Power. Nominal and type of engine.	Horse Power. Actual.	Area sq ft.	Weight in lbs. Total. Empty (including water).	Weight in lbs. Total. With fuel.	Weight in lbs. Total. Performance tests.	Weight in lbs. Total. Reliability test.	Weight in lbs. Useful Load. Certificate of Airworthiness.	Weight in lbs. Useful Load. Performance test.	Weight in lbs. Useful Load. Reliability test.	Fuel used in 7 hours Cruising. Petrol and Oil. Total.	W. G. (a)	Speed in m.p.h. Cruising. Indicated	Speed in m.p.h. Cruising. Actual. (b)	Speed in m.p.h. Cruising. High. (b)	Speed in m.p.h. Cruising. Low. (b)	"Get off" feet above ground. (c)	Landing, yards from mark.	Lbs. per h p. Total. Performance tests.	Lbs. per h p. Total. Reliability test.	Lbs. per h p. Useful Load. Performance tests.	Lbs. per h p. Useful Load. Reliability test.	Lbs. per sq. ft. Performance tests.	Lbs. per sq. ft. Reliability test.
LARGE AEROPLANES.																								
Central Aircraft "Centaur".	2 160 Beardmore	354 at 1250 r.p m	895	4996	5840	7250	7250	7250	(d) 1210	(d) 1210	148.5 11 159.5	(d) 7.6	61	63	89	48	0	281	20.48	20 48	(d) 3 42	(d) 3.42	8 10	8.10
Handley Page "W 8.".	2 450 Napier "Lion"	1008 at 2200 r p m	1456	7850	9843	11443	12500	12500	1400 (e) 1618	(e) 2675	279 9 288	9.2	84	88	119	55	74	263	11.35	12 40	1.60	2.65	7.86	8.58
Vickers "Vimy Commercial".	2 350 Rolls Royce "Eagle"	704 at 1800 r.p.m.	1335	7790	92.7	11 57	11057	12500	1600	1600 (f) 2860	240 12.75 252.75 (f) 294	6.3 (f) 9.7	80	84	103	50	26	308	15.71	15.71 (f) 17.75	2 27	2.27 (f) 4.06	8 28	8.28 (f) 9.36
SMALL AEROPLANES.																								
Austin "Kestrel".	160 Beardmore	177 at 1250 r p.m.	417	1966	2321	2721	2740	2740	200 (g) 181	219 (g) 200	63.55 3.725 67.275	(g) 3 0	81	83	110	45	14	244	15 37	15 48	1.02	1.13	6.52	6.57
Avro Triplane.	230 Siddeley "Puma"	245 at 1400 r p m	498	2460	3064	3683	3683	3666	419 (i) 397	419 (h) 402 (i) 380	105 4.5 109 5	3.7 (i) 3.5	79	83	96	51	1	239	15.03	14 96	1.62	1.55	7 39	7.36
Bristol	230 Siddeley "Puma"	245 at 1400 r p.m.	566	2654	3190	3590	3591	3590	200	200	85 5.18 90 18 (k) 88 58	2.2 (k) 2 4	82	86	108	49	19	3 4	14 65	14.65	.82	.82	6.34	6.34
Sopwith "Antelope".	200 Wolseley Hispano "Viper"	210 at 2000 r.p m	531	2387	28.7	3217	3350	3350 (l) 3450	200	333 (l) 433	70.5 7.125 77.625 (l) 83.75	4.3 (l) 5.1	80	84	110	43	23	188	15 32	15 95 (l) 16 43	.95	1.59 (l) 2.06	6.06	6.31 (l) 6.49
Westland "Six-Seater".	450 Napier "Lion"	504 at 2200 r.p m.	726	3823	4559	5559	5852	5850	800 (m) 840	(m) 1133 (h) 1131	128 3 131	(h) 8.6	86	90	118	46	23	235	11.03	11.61	1 67	2.24	7.66	8.06

The Air Ministry announces :—

The following table gives the data obtained regarding large and small types of aeroplanes taking part in the Air Ministry Competitions at Martlesham Heath.

Notes are appended for explanatory purposes.

EXPLANATORY NOTES.—The reference letters shown on the table refer to the figures directly below them :—

(a) Weight of useful load carried on reliability trial divided by the gallons of fuel consumed—given to the nearest figure in the first place of decimals. The useful load is obtained by deducting from the total weight of the machine, as on the test, its weight with fuel for 450 miles at 80 m.p.h., but without load, and a weight of 200 lb. to represent the pilot and his gear.

(b) Shown to the nearest mile.

(c) Shown to the nearest foot.

(d) This machine carried only enough fuel for 315 miles at 63 m.p.h. These figures are not therefore comparable with the similar figures for the other machines.

(e) Includes an allowance of 218 lb. for excess fuel carried.

(f) These figures show the estimated results if the machine had been loaded up to the full Certificate weight for the reliability trial.

(g) Includes a deduction of 19 lb. for short fuel carried.

(h) Corrected to Certificate of Airworthiness weight.

(i) Includes a deduction of 22 lb. for short fuel carried.

(k) Actual duration of reliability test was 7 hrs. 5 min. These figures are corrected to 7 hrs.

(l) These figures show the estimated results if the machine had been loaded up to the full Certificate weight, which was increased by 100 lb. after the reliability test had been carried out.

(m) Includes an allowance of 40 lb. for excess fuel carried.

[Taking the rules for this Competition, which have been published in a previous issue of this journal, it should be possible from the above table to work out the positions of all competitors in so far as performance alone governs the results.

This may be recommended as a pleasant Sunday afternoon's amusement to all interested readers of THE AEROPLANE, but no prizes are offered for the results of any such computation.

Nor is it certain that so many prizes as are hoped for will be awarded on the results of the similar official computation. —Ed.]

BEARDMORE

AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

SOME GERMAN SEAPLANES.

By ERIK HILDESHEIM.

The German Naval Yards and their Seaplane Work.

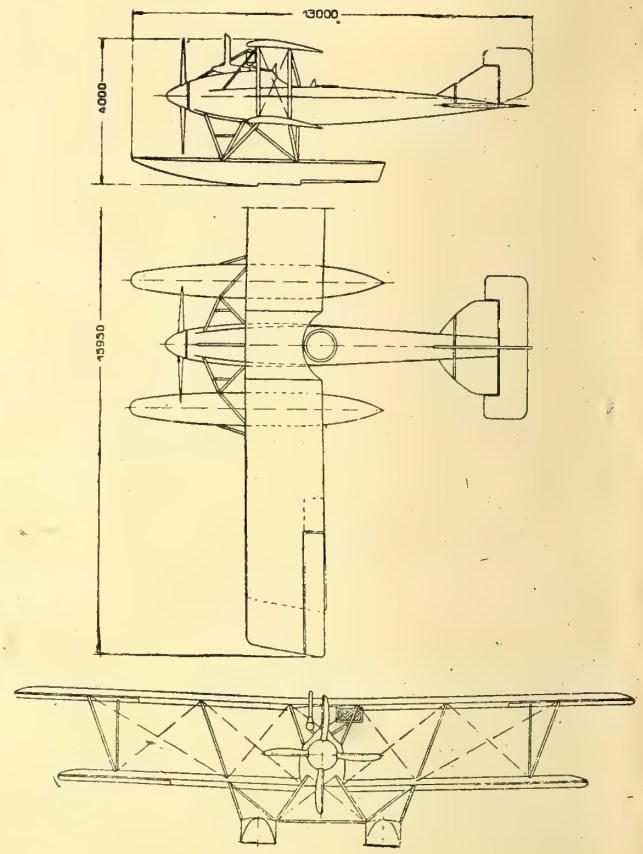
A review of the German Naval aircraft activities gives an idea of excellent organisation. The official establishments at Kiel, Wilhelmshaven, and Dantzig made no attempt to monopolise developments, and the features of all new accepted types were at once circulated to all the naval aircraft manufacturers, and the official inspectors were given a free hand as to variations from the written word. In order of importance the seaplane firms were Friedrichshafen, Brandenburg, Gotha, Sablatnig, Oertz, L.F.G., Lübeck, Travemünde, Rumpler, Albatros, and the Imperial yards. Seaplanes started the war as eyes of the fleet and were equipped with 100 to 120-h.p. Mercédès engines. Mostly they were about 14 mm.. span and 8.5 m. long by 3.5 m. high. The speed was only 90 to 100 km., the climb about 1,000 m. in 20 min., and the getting-off speed 60 km. The seaworthiness was fair. Thus the load per sq. metre was but 25.28 kg., and the power load 12 kg./h.p., carrying pilot, observer, and 40 kilos of bombs.

The navy took quickly to the higher power units, viz., 150-h.p. Benz and 160-h.p. Mercédès. Still mainly engaged on patrol work the seaplanes of late 1915 and early 1916 dropped the power load to 9-10 kg./h.p. and increased the surface to give 30 kg. per sq. m. The overall dimensions rose to 16 m. span, 10 m. length, and 4 m. height, and the speed from 110 to 130 km., the climb doubled to 1,000 m. in 10 min. Then the number and size of bombs grew, and a wireless installation was included in the regular equipment.

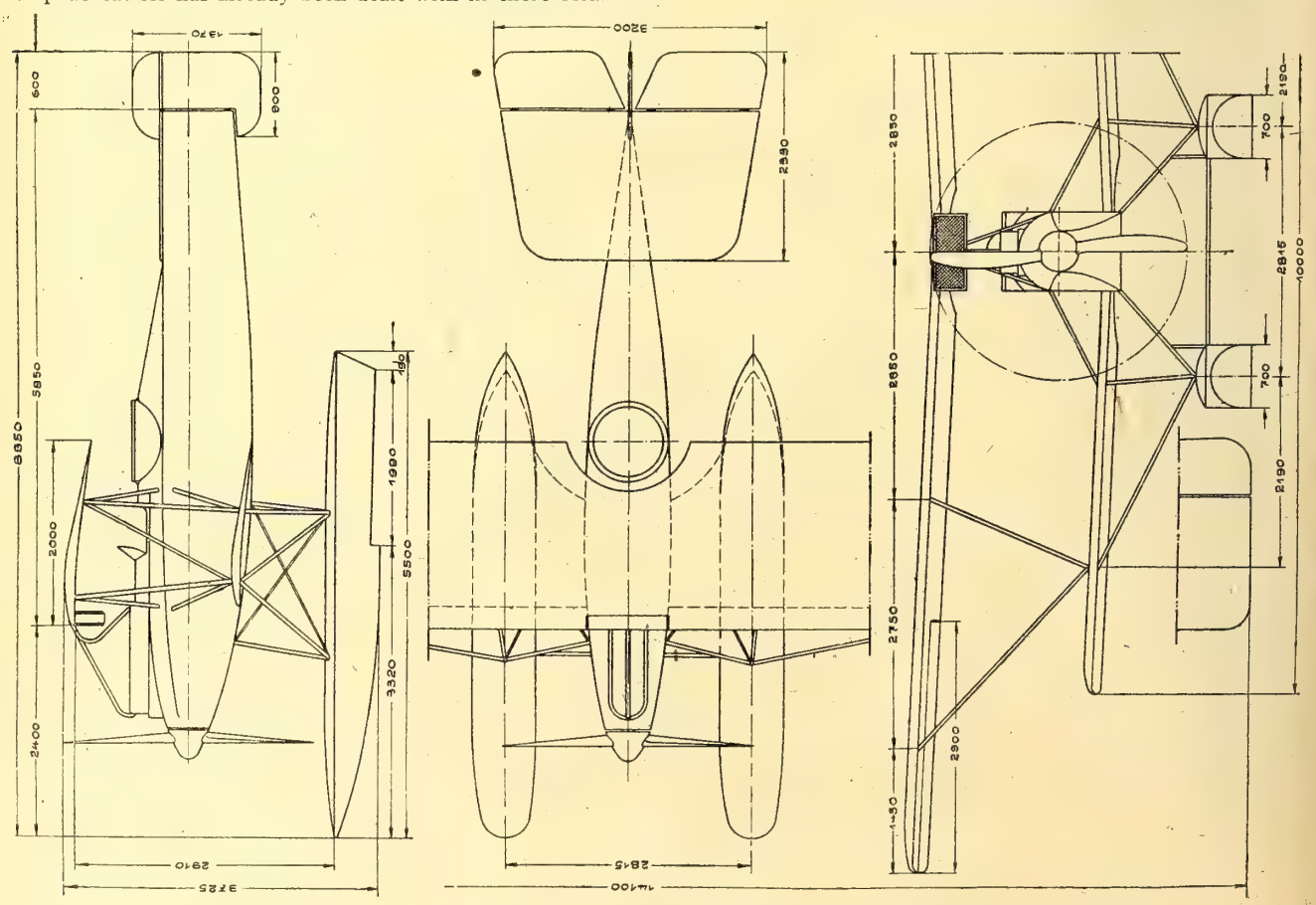
Next the naval single-seater fighter was introduced, the various models catering for different tasks. The Rumpler climbed quick, but flew slower; the Brandenburg was slower in climb, but had a speed of 180 km.; and the Albatros and Friedrichshafen gave an intermediate performance of 170 km. speed and 1,000 m. climb in 5½ min.

To increase speed the three-bay seaplane developed into single or twin-strutted models, though the F.F. Company remained faithful to three bays, decreasing weight and head resistance and improving their aerofoil, and Sablatnig turned out a seaplane with large surface and low load, attaining equal speed by means of a special wing section.

A further step in the form of the twin-engined bomb and torpedo carrier has already been dealt with in these columns.



General Arrangement of a Two-seater Seaplane produced at the Wilhelmshaven Yard.



A Seaplane designed at the Danzig Naval Yard: a two-seater patrol craft with the 160-h.p. Benz engine.

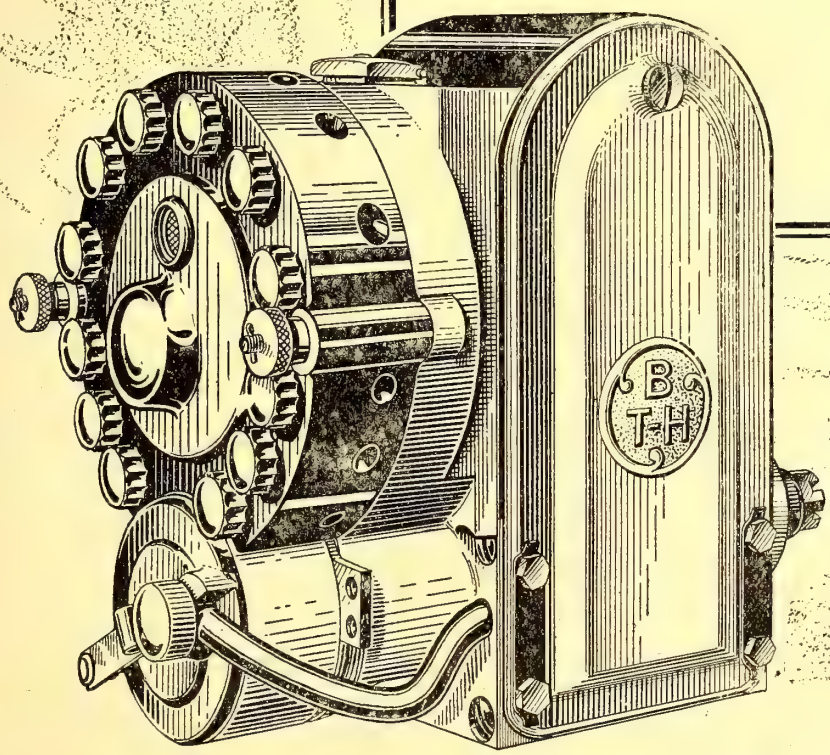
Hendon Aerial Derby.

B.T.H. Magnetos

were fitted to the engines of the aeroplanes that secured first and second places in the Aerial Derby held at Hendon on Saturday, July 24th.

They were also used on the aeroplanes which secured the first and second places in the 1919 Aerial Derby.

The British Thomson-Houston Co., Ltd.,
Lower Ford Street, Coventry, England.
Member of the British Ignition Apparatus Association.



B
T-H

The two 120 h.p. installation was followed by 160 h.p. engines, and the surface and power loading became pretty high in the effort to keep down the span and so keep manœuvrability for fighting. The figures of speed and climb were 120 km. and 1,000 m. in 15 min., with a useful load of 1.4 ton.

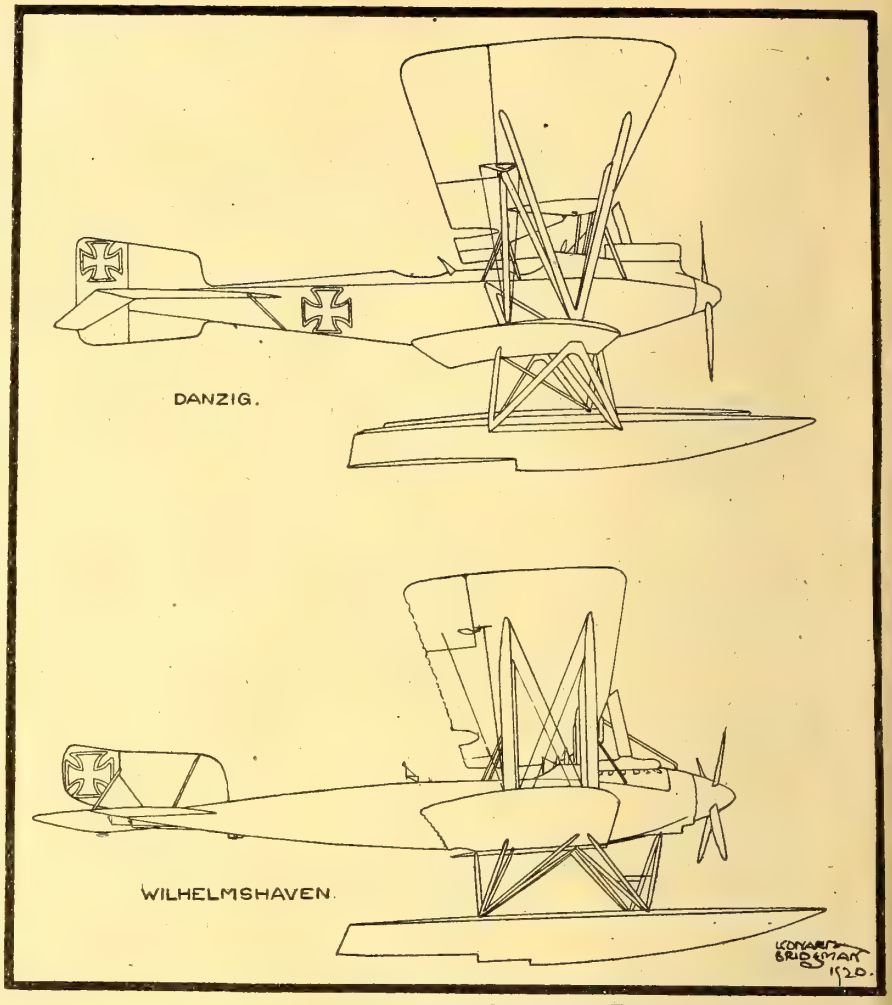
Following contemporary land developments the light C class two-seater, armed with two to three machine-guns, the 200 h.p. patrol mount, equipped either with wireless receiving or sending apparatus, and the similarly engined fighter of 1918, followed in quick succession. The latter was, like the giant naval aircraft of the same year, of the monoplane renaissance type.

The service organisation was based upon the acceptance station at Warnemünde, and the repair facilities at the dockyards at Wilhelmshaven, Kiel and Danzig, which overhauled the service machines and erected the aircraft on delivery from the makers.

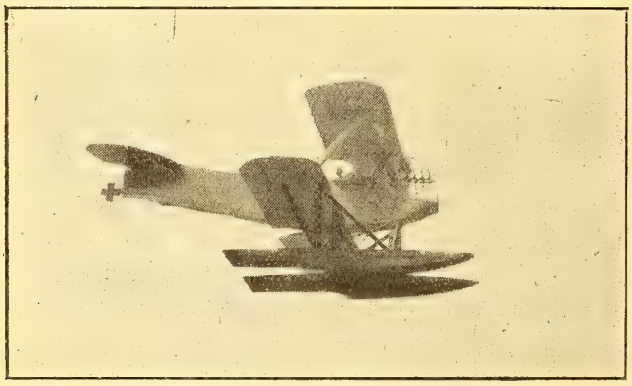
Later they were turned into regular works and turned out seaplanes of their own, and a licence was taken for building Benz engines.

Owing to the position of the yards it followed that Wilhelmshaven supplied the North Sea and Flanders stations. Kiel was the base for the western Baltic squadrons and Danzig for the eastern part of that sea up to Russia. The two latter yards also fed the Rumanian, Turkish and Asiatic naval squadrons.

Illustrations and scale drawings of certain of the products of the Wilhelmshaven and Danzig yards, which are attached, indicate that their work was in the main on conventional lines. The most interesting feature shown is the tendency to dispense with flying wires in the inner bay of the wings, thus giving a safe forward field of fire for the aft gunner.



Two typical German Navy Yard Two-seaters.



A Brandenburg C Class Two-seater.

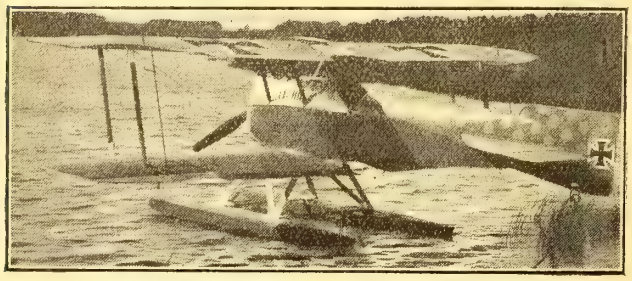
BRANDENBURG SEAPLANES.

In asking for information of their activities for 1920 I found the managing director of the Brandenburg Seaplane Works take up an attitude quite different to the general behaviour. For his outlook was that to keep the last shred of national dignity, most of which he considered had vanished and thus caused Germany's present state, he could not see his way to give any trade news to be published in an English work, though he might have given some for publication in Denmark, had one called before the Sleswig voting.

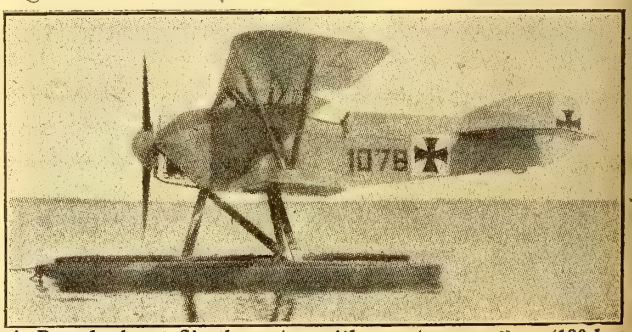
Since one has to take this German standpoint as it stands one can only publish pictures of some of the many experimental seaplanes built by this concern. Of these, the active service specimens were the final outcome, and they are as enlightening as, for instance, the many pictures of experimental Nieuports which have been published as to the development of that outstanding French product.

The final Brandenburg monoplane sea fighter is well known by appearance and scored heavily during the last months of the war, when its activities should have asked for trouble from some superior opponent. The earlier biplane of 1918 has also been shown and the evolution to the monoplane by the removal of the top plane commented upon. The works, which were originally the Brandenburg branch of Herr Igo Etrich's "Sportfluger" enterprise at Johannisthal, were next, by Austrian financial influence, amalgamated with Carl Caspar's Hanseatic Aircraft Works at Hamburg and the Rummelsburg Works, one of the earliest German aerial ventures, and used now for repair work. The combine served even Austrian contracts.

Of the hitherto undescribed machines the following not particularly elegant specimens are of interest.

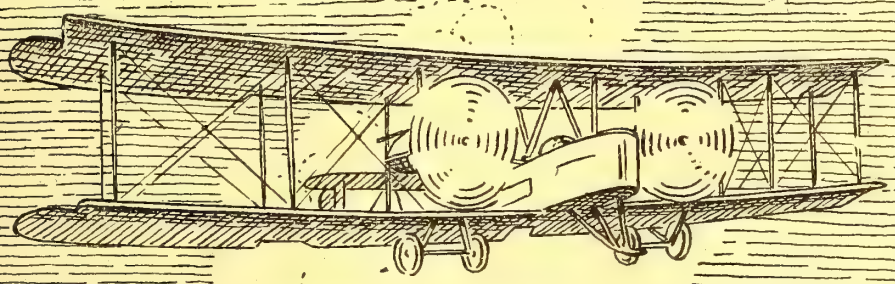


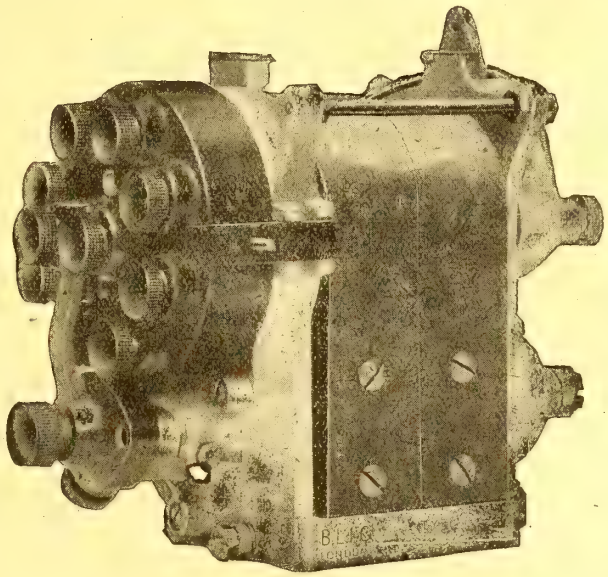
An Early Brandenburg Single-seat Fighter



A Brandenburg Single-seater with a rotary engine (160-h.p. Oberursel) and Nieuport Strutting.

B·L·I·C





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The principle of construction makes them not only reliable, but also noiseless and compact. There are no bare external contacts.

Write us for Catalogue.

The single-seater shows its fighting intent, the almost gap-filling fuselage being especially favoured by the chief commander of the Austrian Air Force, Colonel Uzelac, the intention being to reduce the tail "blind spot." A machine of apparently contemporary date showed Nieuport influence in the small lower plane and Vee struts, and was powered by a 160-h.p. Oberursel rotary engine. The light C class two-seater biplane is distinguished by a very heavy stagger and a single interplane and centre section I strut arrangement, but will be seen to show already the characteristic Brandenburg raised fuselage and tail unit.

Brandenburg naval activities extended also to flying-boats, for which a cross-star strut arrangement was a favourite. This system was also adopted for seaplanes and in landgoing aircraft, particularly on a scout used by the Austrians.

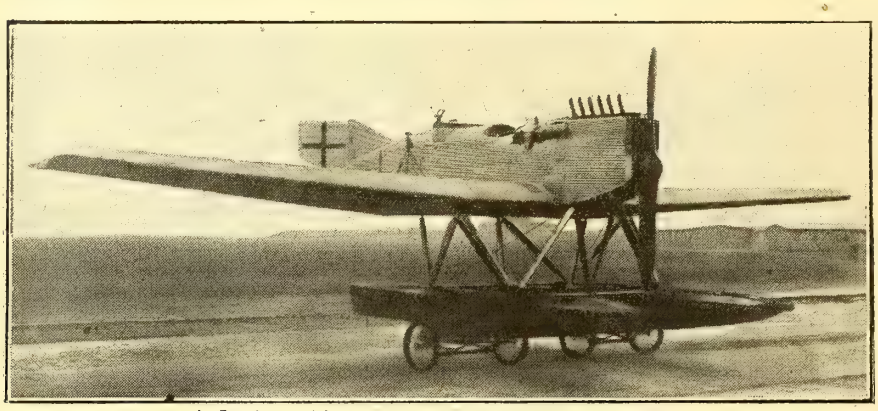
THE JUNKERS TWO-SEATERS.

Professor Junkers is the inventor and manufacturer of an opposed piston Diesel engine and a scientist of imagination. In 1917 he founded an aeroplane manufacturing company to introduce his new ideas, with the financial co-operation of Fokker, always quick to realise the value of an innovation. The aircraft works expanded quickly at Professor Junkers' works, at Dessau, and after the armistice passed into his sole control.

Official reports have dealt with captured specimens of the armoured contour fighter biplane T.1 and scout monoplane D.1; thus of the Junkers' war activities only the two-seater monoplane of the late "C.L." remains. It was produced both as land and seaplane and closely followed the D class, but was powered by a Benz super-compressed 200-h.p. engine.

Hereafter follow the specifications of these two Junkers' models. The S, after the class mark, indicates the purpose for which the aircraft is intended, S standing for Schlachtflugzeug, the German equivalent for ground fighting aeroplane.

Name and type No. of machine	Junkers Naval C.1
Type of machine	2-seater Patroller
Built of	Duralumin
Length	8.8 m.
Span	12.75 m.
Height	3.22 m.
Engine type and h.p.	185 super-compressed Benz
Weight, empty	914 kg.
Weight, flying	1,420 kg.
Fuel capacity	4 hr.
Machine-guns, fixed	2
Machine-guns, swivelling	1
Speed	18 k.p.h.



A Junkers All Metal Seaplane (185 Benz engine).

Name and Type No. of machine	Junkers C.L.S.
Type of machine	Two-seater Contour Fighter
Built of	Duralumin
Length	7.9 m.
Span	12.2 m.
Height	3.1 m.
Engine, type and h.p.	160-super-com. Mercédès
Weight, empty	735 kg.
Weight, flying	1,155 kg.
Fuel capacity	2 hr.
Machine-guns, fixed	2
Speed	120 k.p.h.

THE INSTITUTE OF TRANSPORT.

The Institute of Transport has been registered as a company limited by guarantee, not formed for the purpose of profit, the word "limited" being omitted from title by licence of the Board of Trade. The number of members is unlimited, and each member is liable for not more than £1 in the event of winding up.

The objects are: to promote and encourage knowledge of traffic science and the art of transport and the means and appliances connected therewith, to provide facilities for study and the exchange of ideas, to grant certificates, medals, diplomas and scholarships, to raise the status of those engaged in traffic and transport, to promote exhibitions, to form a library, etc. The income and property of the Institute is to be applied solely towards the promotion of its objects, but payment in good faith of interest, at not more than 5 per cent., on any loans advanced by members, to promote the objects of the Institute is permitted.

The Institute is to consist of members, associate members, graduates, students and honorary members. Members and associates only are to be "members" for the purposes of the Companies Act. They must have had respectively ten or five years' experience involving official responsibility in dealing with traffic or providing transport or works connected therewith, or fulfil other specified conditions.

Members and associates may describe themselves as "M.Inst.T." and "A.M.Inst.T." The following have consented to become members of the Council: Sir Eric Geddes (Minister of Transport), Mr. J. Allen (Oxford Steam Plough Co., Ltd.), Lord Ashfield, Mr. J. Bagwell (General Manager, G.N.R., Ireland), Mr. H. E. Blain, Sir A. A. Booth, Sir J. G. Broadbank (Member, Port of London Authority), Sir A. K. Butterworth (General Manager, N.E.R.), Mr. H. P. Currie, Sir F. Dent, Mr. G. A. Dutfield, Sir J. E. Eaglesome (General Manager, Aire and Calder Navigation), Sir S. Fay (General Manager, G.C.R.), Sir M. Fitzmaurice, Mr. E. Garcke (Director, British Automobile Traction Co., Ltd.), Mr. H. H. Gordon, Mr. J. B. Hamilton (Commercial Manager, City of Leeds Tramways), Sir W. Joynson-Hicks, M.P., Mr. R. J. Rowley, Sir L. L. Macassey, K.C., Mr. D. A. Matheson (General Manager, Caledonian Railway), Sir H. P. Maybury (Director-General of Roads), Mr. J. C. Mead (Mead, Son and Hussey), Mr. J. M. McElroy, Sir P. A. M. Nash (Director-General of Traffic), Sir J. W. Orde (Secretary and General Manager of R.A.C.), Mr. S. Preston (Member, Canal Control Committee), Sir W. Raeburn, M.P., Sir A. Read (Managing Director, Coast Lines, Ltd.), Mr. G. Renwick, Sir A. Stanley (Chairman, Tramways and Light Railways Association), Mr. E. S. Shrapnell-Smith (Transport Director), Mr. F. Tatlow (General Manager, M.R.), Sir H. A. Walker (General Manager, L. & S.W.R.), Mr. J. Wilmot, and Mr. W. Wolsey (Director, Thos. Tilling, Ltd.).

THE DE PISCHOFF "AVIONETTE".

M. de Pischoff has been carrying out tests with his small aeroplane, which so far have been successful. Fitted with a 16-h.p. Clerget-Blin (two-cylinder) horizontally-opposed engine the machine got off after a short run and flew at a height of 200 metres at a speed of 95 kilometres per hour. In flying, turning, and landing it performed only as one might expect any self-respecting aeroplane to perform.

Its construction is entirely metallic. The following is its brief specification:—

Span	5 m. 20
Length	3 m. 52
Height	1 m. 30
Surface	7.50 sq. m.
Weight empty	102 kilos.

By folding the wings and hinging the tail the machine is compressed to the following dimensions:—

Length	3.52 m.
Height	1.30 m.
Width	0.92 m.

COMPANY NOTICES.

New Companies.

FLYING AERO-MODEL CO., LTD.—Private company, registered Sept. 2nd. Capital, £2,500 in £1 shares (1,500 preference). To carry on the business of scientific aero-model manufacturers, dealers and retailers, as formerly carried on by C. J. Yuske. The subscribers (each with one share) are: V. V. Dibousky, 101, Ashley Gardens, S.W.1, engineer, and N. Wiren, 101, Ashley Gardens, S.W.1. The permanent directors are: C. J. Yuske, V. V. Dibousky, W. H. Appleton and N. Wiren. Solicitor: C. L. Baddeley, 77, Leadenhall Street, E.C.

Mortgages, Charges and Satisfactions.

AIRCRAFT MANUFACTURING CO., LTD.—Particulars of £25,000 debentures authorised Aug. 20th, 1920; whole amount issued. Property charged: The Company's undertaking and property, present and future, including uncalled capital.

Receiverships.

UNITED AIRCRAFT CO., LTD.—H. Holmes, of 2, Fenchurch Street, E.C., as receiver or manager on Aug. 20th, 1920, under powers contained in mortgage debentures dated Oct. 14th, 1919, and Jan. 6th, 1920.

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AeroEngines

NOTICES TO GROUND ENGINEERS.

Air Ministry, Sept. 1st, 1920.

No. 1.—Explanatory Statement.

It is hereby notified: The question of acquainting Ground Engineers with such technical information in connection with Civil Aircraft as is essential to the efficient discharge of their duties has been under consideration by the Air Council. It has been decided to issue such information periodically in the form of "Notices to Ground Engineers" in the same manner as information of importance to pilots is now issued in the form of "Notices to Airmen."

"Notices to Ground Engineers" will contain information as to the embodiment of modifications affecting the safety of aircraft and such points in regard to inspection as have been shown by experience to require special attention.

These "Notices" will be issued to all owners of aircraft, to the Aeronautical Press, and to such Public Bodies as are interested. In order that the information circulated in this manner may be of value it is essential that it should reach all licensed Ground Engineers, and it is therefore incumbent on owners of aircraft as the employers of persons giving certificates of fitness before flight to see that the "Notices" are communicated to and observed by all such persons in their employ. Further, all Ground Engineers when receiving their licences for the first time will be advised to ask their employers to acquaint them with these "Notices."

No. 2.—Petrol-Resisting Rubber Tubing and Connections.

It is hereby notified: Attention is called to the necessity of frequent examination of all petrol-resisting rubber tubing and connections used on aircraft to convey petrol, oil, or hot water. Engine failures in the air have been traced to the use of this material when in a deteriorated condition.

Service conditions during the war have shown that this material must be regarded with suspicion after having been in use for a period of four months for sizes up to ¾-in bore and six to nine months for larger sizes.

This tubing should conform with the requirements of the British Engineering Standards Association Specification No. 2.F.7, in which the requisite number of canvas plies should not be less than two for the 5/8-in. bore size, not less than three for bores 11/16 in. to 1½ in., and not less than four for larger sizes.

The most efficient test of this tubing is to boil a portion of the tubing in petrol for one hour, to be followed by immersing in cold petrol for a period of 24 hours, after which the sample should be examined for the quality of rubber, swelling and adhesion of rubber to canvas. Where it is not possible to carry out such a test, an indication of the condition may be obtained by "picking" at the end with the thumb-nail, thereby enabling brittleness and lack of adhesion of rubber to the canvas to be detected.

Owing to the tendency of this tubing to perish when subjected to extreme temperatures or strong light, it should always be stored in a dark place at a normal temperature, and should be coiled in such a manner as to prevent "kinking."

Air Ministry, Sept. 2nd, 1920.

No. 3.—Streamline Wires

It is hereby notified: Streamline wires may be damaged whilst being adjusted, owing to pliers being employed either to turn the wires or to hold them whilst securing the lock-nuts. The rough jaws of the pliers make comparatively deep cuts in the surface, which develop into cracks after being subjected to vibration in flight, and which ultimately cause the wires to fail.

To obviate such failures, a special tool for holding or turning the wires should always be used, and on no account should pliers be employed for this operation.

Cases have occurred where a wire has been twisted at one end during adjustment, and in one instance a wire was found to have four complete turns in its length. Twisted wires have their strength seriously reduced, and, in addition, they no longer fulfil their streamline functions.

Care is necessary to ensure that the fork ends used on the smaller sizes of wires are not opened out during adjusting. If a fork is damaged in this way it should not be closed in to make the shackle pin fit, but a new fork end should be provided before the machine is flown.

No. 4.—Safety Belts and Harness.

It is hereby notified: Attention is drawn to the necessity of ensuring that the fitting and maintenance of safety belts and harness in aircraft is secure and functions correctly.

Service conditions have shown the necessity of any belt or harness safely withstanding a tensile load of 500 lbs. without visible signs of fracture, and that the release gear is capable of operating when the belt is under a load of 200 lbs. In consequence, anchorage fittings should be of the same strength.

Where ropes are used for attaching the belts, the strength of the rope should be approximately 10 cwt. "Lapped" joints in ropes are considered unsatisfactory, and the use of ropes which allow of a spliced or "whipped" joint is more satisfactory. In all cases of "whipping," good quality kite cord should be used, and the "whipping" carried out while the joint is under tension, in order to minimise the slip when subjected to subsequent strain. All loose ends of ropes should be "served," to prevent fraying, and in no case should a rope be connected directly to a plate where chafing may occur.

Anchorage plates, where secured by bolts, should be so arranged that the shear is taken near the bolt head instead of the screwed end, as cases have arisen where the plates bearing on the screwed end have sheared the bolt. The minimum diameter of any bolt to be used in anchorage fittings should be 2 B.A. The fixing of an anchorage plate or connection to the middle of a structural member should be avoided, and the belt should be so arranged as to sustain the upper part of the body.

The release gear on the belt should always be correctly positioned for easy manipulation, and should be maintained in a lubricated condition.

The leather portions of the belt should be periodically treated with linseed oil or wax.

No. 5.—Control Pulleys and Running Cables.

It is hereby notified: Particular attention should be given to control pulleys and running cables on machines operating from the seashore or sandy places.

The cables in the vicinity of pulleys and leads should *not* be greased on these machines, owing to the cutting action of the sand and grit which adheres to the grease.

No. 6.—Arrangement of Oil Filter on Aeroplanes Fitted with Napier "Lion" Engine.

It is hereby notified: Certain aeroplanes fitted with the Napier "Lion" Engine have the oil filter so fitted that the top of the filter is approximately level with the top of the oil tank. The oil pipe from the tank leads to the bottom connection on the filter body and the top connection takes the pipe leading to the oil pump.

This arrangement allows the possibility of an air lock forming in the pipes, and if, therefore, any aeroplanes are still in service with the filter fitted as above, the pipes should be re-arranged so that the oil pipe from the tank should lead to the top connection of the filter and the bottom connection should lead to the oil pump.

If, however, the oil tank is fitted above the pressure oil pump inlet, a cock should be fitted in the pipe between the filter and the oil tank. This cock should be capable of being locked in the open position.

It is further recommended that a warning plate should be fixed in a conspicuous position in the pilot's cockpit, directing attention to the necessity for opening the cock before starting the engine and for closing the cock on completion of engine running. This latter precaution is necessary to prevent oil draining from the oil tank through the pump gears and flooding the engine sump.

No. 7.—Avro 504 and 536 Type Machines.—Upper Shoe Fitting for Engine Diagonal Strut (Part 100).

It is hereby notified: Attention is drawn to the above-mentioned fitting (Part 100) on Avro 504 and 536 type machines. Instances of the failure of this part have been discovered which, if undetected, might result in failure of structure.

All Ground Engineers operating should make a special examination of this fitting in all machines of these types under their supervision.

EXAMINATIONS FOR AVIATION GROUND ENGINEERS.

AIR MINISTRY COMMUNIQUE No. 608.

The Air Ministry announces:—

Examinations of candidates desiring to become certified ground engineers (aircraft or engines) will be held at the following centres during September and October:—

September.—London, Wednesday, Sept. 15th, and Wednesday, Sept. 29th; Bristol, Tuesday, Sept. 21st; Birmingham, Wednesday, Sept. 22nd; and Manchester, Thursday, Sept. 23rd.

October.—London, Wednesday, Oct. 13th, and Wednesday, Oct. 27th; Leeds, Tuesday, Oct. 19th; Newcastle, Wednesday, Oct. 20th; and Glasgow, Thursday, Oct. 21st.

The examinations may be partly written, partly oral, and partly practical. They will be based on the syllabus outlined in Section 4 of the Air Navigation Directions, 1919.

Candidates desiring to be examined can obtain application forms from the Secretary, Air Ministry, London, W.C.2, and should submit their completed forms of application, accompanied by a fee of 5s., at least seven days prior to the date on which examination is desired. Candidates should also state at which of the above places they wish to be examined.

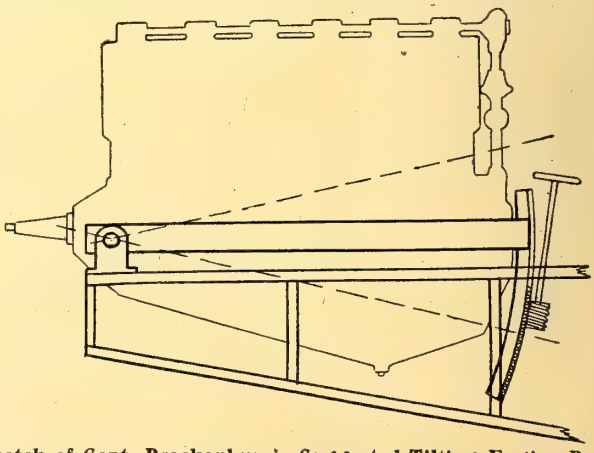
AN INTERESTING PROPOSAL.

The average aeroplane of to-day has a flying range of some 12 to 15 degrees in its angle of incidence. With the usual type of fixed wing and fixed engine machine, this means that only at some one particular angle of attack is the line of airscrew thrust parallel to the line of flight, and that at extreme angles there may be a divergence between these two lines of something like 10 degrees.

The French constructor, Paul Schmilt, has long since avoided this trouble by arranging his wing cellule so that the incidence varies relatively to the line of airscrew thrust, and machines so constructed performed extremely well in the early years of the war and just before. The mechanical complications inseparable from moving the wing stretchers relatively to the body are, however, very considerable, and the system appears to have been abandoned.

A much simpler method of obtaining the same end is due to Capt. K. F. Brackenbury and has been protected by him. Capt. Brackenbury proposes to mount the engine on a pivoted bed, and to rock it relatively to the fuselage, in such wise that the line of thrust can be kept parallel to the line of flight. It is claimed that in this manner a higher all-round airscrew efficiency can be maintained. Not only this, but it will be obvious, on consideration, that alteration in the relative line of airscrew thrust can be used to provide some effective longitudinal control, tilting the nose of the engine, in the case of the ordinary tractor machine, up, tending to increase the angle of incidence—i.e., causing the line of flight to tend to follow the line of thrust. The extent of this tendency will vary with the distance separating the pivot about which the engine rocks and the centre of gravity of the whole machine, but it seems possible that such an arrangement could be effectively used for trimming a machine in place of the usual variable tail plane.

It is, of course, subject to the limitation that it ceases to operate as a control if the engine ceases to function.



Sketch of Capt. Brackenbury's Suggested Tilting Engine Bed.

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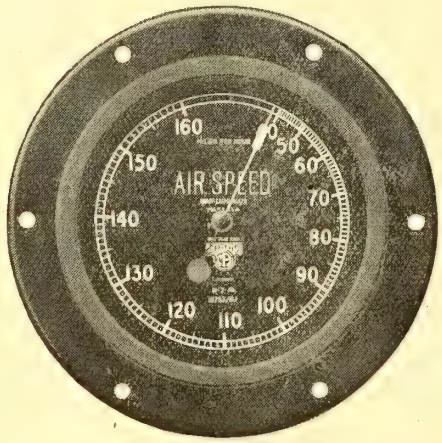

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(*Continued from page* 512.)

Flowers by Aeroplane.

The exhibit of Mr. E. Krelaye, of Haarlem, at the National Dahlia Society's show at Vincent Square, on Sept. 7th, was sent from Holland to England by air.

Those Markings!

According to the Air Ministry arrival and departure communiqués, a S.N.E.T.A. D.H.4 is marked "O—BABI." This is not, as might first be supposed, an advertisement for a new revue, but, as the office-boy of THE AEROPLANE remarked, "'S neat a title as I ever 'eard.'—G. D.

Cowes.

On Sept. 8th, H.R.H. the Princess Beatrice paid a visit to Messrs. S. E. Saunders and Co.'s aircraft works at Cowes and inspected the new amphibian machine, "Kittiwake."

East Fortune.

Arrangements are being made at East Fortune for the northern trip of the R.80, which may, accompanied by the R.34, pay a visit to Edinburgh and the East Coast of Scotland. It is expected that she will arrive next month.—MAC.

SCOTLAND.

Aberdeen.

A large firm of manufacturers in Aberdeen have obtained permission for the utilisation of a fleet of seaplanes which they have purchased. The machines will be used for the maintenance of their supply service round the Northern districts and a slight way down the East Coast. Longer journeys are being contemplated and instructions as to dealing with traffic from Norway and Scandinavia directed to the firm are being issued. Several short flights to surrounding districts have been made, and the enterprise is paying both as regards finance and the saving of time and labour.—MAC.

A North Sea Air Line.

As regards commercial aviation in Scotland, serious opposition is being offered to Edinburgh by Dundee. If the plans of the Air Ministry materialise, the city on the Tay may be the home of a fleet of flying boats maintaining a service between this country and Norway. A letter has been received from the Secretary of the Air Council stating that the authorities at Dundee have at present no power to hold or even acquire land to be used as an aerodrome. The Air Navigation Bill at present before Parliament will enable such powers to be granted, and if this is the case the Edinburgh authorities contemplate a stiff fight for supremacy with the Council in Dundee. The Ministry in their letter also state that "the possibilities of the opening of a direct flying-boat route between Dundee and Norway should not be lost sight of." The Air Ministry, in taking this attitude, are thus making promises as regards the same object to two different cities. A considerable time ago they promised that Edinburgh should have the sole control of a Norwegian and Scandinavian route, and Turnhouse and East Fortune (which, by the way, has not yet been closed) were mentioned as the probable aerodromes. The Edinburgh authorities have already started to find objections galore to the Dundee proposal. The Dundee councillors in making such a claim have apparently lost sight of the fact that they would cause endless trouble, if this service is secured for them, by the delay which would ensue in transporting goods to and from their station. Edinburgh is a more central station for such a terminus, and in Edinburgh, too, there are better facilities for dealing with such traffic. Another point that is brought to the front is that the air stations in Edinburgh are in better condition than those which could be secured in Dundee. The view is taken in Edinburgh that if the Air Ministry had done their duty they would have pointed out to the Dundee authorities, when they were making their claim, that such a service was reserved for Edinburgh. There will, evidently, be several squabbles before a peaceful finale is arrived at, but Scottish sympathies are with Edinburgh.—MAC.

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

Rewards.

It is announced that the King has been pleased to award the Air Force Cross to Lieuts. Parer and MacIntosh for their flight from England to Australia.

On Sept. 14th Messrs. Parer and MacIntosh were each presented with a cheque for £550 in recognition of their England-Australia flight.

CANADA.

Forest Mapping from the Air.

From experiments that have been carried out in aerial photography in the St. Maurice Valley, Quebec, it appears that, from photographs taken in the autumn at from 3,000-5,000 feet, it is possible, owing to the fact that the leaves have turned colour, to distinguish between the hard and the soft woods, and that after some experience in reading these aerial photographs it will be possible, with the aid of certain necessary ground work, to distinguish the various forest types for mapping purposes. It is believed that excellent results can be obtained by these means.

SOUTH AFRICA.

The following letter has been received:—

Sir,—Will you kindly allow me to remark on a passage appearing under S. African Aviation Notes by "Imoges" in your paper of the 23/6/20?

After giving a description of aviation events and conditions in S. Africa he continues: "Gen. Smuts is personally very interested, but his position is by no means secure at present, and he has to deal with his 'loyal' fellow-countrymen, the majority of whom are more interested in trying to secure for the 'vaterland' a republic. To carry on with, however, they are securing a new army uniform (German colour and style) and a new flag, on which the Union Jack will not be conspicuous and so hurt the poor Boers' feelings. Besides, not only is flying not mentioned in the Bible, and therefore not allowed, but it is sure to be another trick of the British Government to harm them."

One supposes "Imoges" to be funny—but as his sarcasm is uttered outside his club in a very widely circulated paper, one can only take it as a bit of innocent stupidity that is very insulting to a large section of the Dutch people, many of whom have done more to make the Union Jack a symbol of Empire than "Imoges" ever will by his rancorous writings.

Does he still live in the Jingo past, and is he ignorant of the new Imperialistic Era we are in when he is expected to be one of thousands pioneering the cause, and embedding the foundations of the visionary Empire? Why does he insist on mixing the interests of aviation with political controversies? He shows himself a hopeless diplomatist and seems more like the foreigner who decries everything that does not suit his Jingo ideas, instead of setting to work methodically to remedy any existing "evils." This type of person is of very little service to this country, as he only causes useless ill-feeling to embarrass and hamper the very Government from whom he expects to receive assistance.

Naturally, one is not supposed to pay much attention to remarks such as his—yet, strange as it may seem, it is the very material to influence the public unconsciously. Besides, it hampers the cause of aviation by giving an impression that this country resembles Mexico somewhat.

Gen. Smuts' Government is as secure as ever, and he knows exactly what he is doing, and more dexterously than "Imoges."

During a recent tour one found the very people he censures the most enthusiastic to support the development of aviation. If he expects the Government to start on a large aviation policy before studying the conditions and requirements, he is greatly mistaken, as the economic condition of affairs does not warrant it.

Excuse me for dwelling on a subject only partly appertaining to aviation. For the same reason I must skip his previous remarks in the same paragraph.

Thanking you for your patience,

Yours truly,
H. P. S.

FOREIGN INTELLIGENCE.

ARGENTINA.

Of the four aviation schools advertising in the Argentine newspaper, *La Nacion*, two—the Handley Page Co. and the River Plate Aviation Co. (a branch of the late lamented Airco)—are British. The other two are the Compania Franco-Argentina de Transports Aereos, of French extraction, and the American Curtiss Co. There appears to be considerable activity at the British aerodromes at Hurlingham (Handley Page) and San Isidro (River Plate Aviation Co.), and the pilots are giving exhibition and passenger flights all over the country.

CHILI.

A Suggested New Mail Company.

At a meeting held at the Aero Club of Punta Arenas (Straits of Magellan), Chile, it was decided to study the question of forming a limited company, with a capital of 1,000,000 pesos, for the purpose of establishing a system of aerial communication from Bahia Blanca and that town. The project is supported by the Bank of Chile and the Argentine. The total distance is 2,093 km., and it is proposed that the service be run in twelve stages: Bahia Blanca-Patagones, San Antonio Oeste, Puerto Madryn, Trelew, Rawson, Cama-

rones, Comodoro Rivadabia, Deseado, San Julian, Santa Cruz, Puerto Gallegos, Punta Arenas, each approaching 200 km. in length.

Flying solely morning and evening, when the weather conditions are favourable, it is believed that mails could reach Punta Arenas in 40 hours from Bahia.

A German Aeronautical Mission.

According to *Auto y Aero* of Santiago de Chile, a German aeronautical mission is expected shortly to visit South America, with the intention of finding there a market for German-built civil aircraft.

A German pilot of the name of Max Holtzem, now in Buenos Aires, appears to be acting as the advance agent for the mission.

CZECHO-SLOVAKIA.

It has been reported that an international aerodrome to serve as a junction for the air routes over Central Europe is shortly to be opened at Prague, where the existing aerodrome is being added to and improved for the reception of international commercial aircraft.

DENMARK.

The Danish correspondent of THE AEROPLANE writes :—

The P.O. Flygkompani.

A comparison with the activities of the P.O. Flygkompani in Sweden with their British aircraft is offered by the figures of one of the German pilots, Lieut. Hans Hecken, who last year came to Denmark with Albatros, Sablatnig, Brandenburg, and Rumpler aeroplanes. In 859 flights of 137 hours' duration he has covered 16,600 km. with 1,435 passengers, consuming 19,180 litres of petrol, or 40 to 45 litres per hour. He is now engaged by a motor-car dealer in the province who has erected his own aerodrome with shed accommodation for two aeroplanes.

The Danish Aerial Navigation Company.

Some of the D.H.9s bought by the Danish Aerial Navigation Co. have now arrived by air from London with passengers, piloted by Messrs. Faber and Fowler, and are to be engaged on the three-weekly service, the first flights of which were meanwhile carried out by A.E.G. and L.V.G. D.14 aircraft along the German coast. On the Copenhagen-London service starts to London are made on Tuesday, Thursday, and Sunday, from London on Monday, Wednesday, and Friday.

The time-table and fares are as follows :—

Arrival Copenhagen 7 p.m.—HI.
,, Malmö 9 a.m. Fare 80 Sw. crowns.
Arrival Warnemünde 11 a.m. Fare 220 Sw. crowns.
,, Berlin (daily) 1 p.m. Fare 950 mark.
Leave Warnemünde 11.30 a.m.
,, Hamburg 2.30 p.m. Fare 1,200 mark.
,, Bremen 4 p.m. Fare 600 mark.
Arrival Amsterdam 7 p.m. Fare 2,200 mark.

Amsterdam-London and London-Amsterdam twice daily and according to demand :—

Leave Amsterdam 9 a.m.; arrival Bremen 12.30 p.m.
,, Bremen 12.45 p.m.; leave Hamburg 2 p.m.
Bremen. Arrival Berlin 3 p.m. Sablatnig service. Fare 2,000 mark.
Leave Warnemünde 4.30 p.m.; leave Malmö 6.45 p.m.
Arrival Copenhagen 7 a.m.—HI.

FRANCE.

Promotions in the Legion of Honour.

In the *Journal Official*, dated Sept. 8th, the Cross of the Legion of Honour has been bestowed on Messieurs Tellier, Schreck and Levy, all of whom are well known as designers and constructors of seaplanes.

The Paris Salon.

Owing to the difficult period through which the Automobile Industry is now passing, it has been decided not to hold the Aero Show or the Automobile Show in Paris this year.

GERMANY.

A New Air-Port.

According to a message from Bremen a sum of 11,000,000 marks (about £60,000 at present rates of exchange) has been subscribed for the establishment of an air-port in that city. The establishment will consist of a Customs House, sheds, repairing shop, and a signalling station. The aerodrome will be particularly large

The Death of Delag.

It is now to be accepted as certain that Delag (the Deutsche Luftschiffahr A.G.) has now ceased to exist. This company, which owned the "Bodensee," is no longer able to continue in view of the aeronautical clauses of the Peace Treaty. During the period of the "Bodensee" service between Berlin and Friedrichshafen receipts of 1,330,000 marks were obtained as against an expenditure of 149,000 marks.

A New Service.

On Aug. 31st an aerial service between Berlin, Bremen, and Amsterdam began. The service is connected at Amsterdam with one to London. Aeroplanes will leave Berlin three times a week.

The Danish correspondent of THE AEROPLANE writes :—

The Death of Lieut. Griebsch.

Another Pour le Merite pilot lost his life when in a test flight the carburetter of a commercial aeroplane of Lieut. Griebsch caught fire at an altitude of 50 m. and the petrol tank exploded. Lieut. Griebsch was pilot from 1912, was severely wounded by Garros in 1915, and engaged especially on long-distance reconnaissance.

A Long Seaplane Flight.

The pilot Frantz, of the "Deutsche Luft-Rederei," carried out recently one of the longest flights in Germany. The seaplane started from Norderney at 1.55 in the morning in pouring rain and storm, landed at Warnemünde by thunder at 11.15 a.m. Nicolaiken at the Masurian Lakes was reached next morning at 7.50 a.m. The next day the passenger was flown back the same way, 2,400 km. having been covered.

A Holiday in the Air.

A company of tourists hired another seaplane of the "Deutsche Luft-Rederei" at Warnemünde, flew via Copenhagen to Gothenburg, and following the channels on to Stockholm and later return.—HI.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

A New Aerodrome.

A new aerodrome run by a company, initialled S.P.A.D.A., whose H.Q. address is at Rome, has been opened during the summer at Rosburgo-Teramo, on the seashore. One D'Antonio is managing the business, which is reported to have been quite lucrative owing to the numbers of joyrider visitors who take their holiday at Rosburgo. Here, as in other countries, people will fly as often as pilots will go up if these latter are known to be thoroughly competent and the machines to be kept airworthy.

The Finnish Mission.

The Finnish Mission is waiting about to be flown home on Savoia 9s, or so it is said.

Polish Supplies.

Poland, which was some time ago reported to be waiting for S.V.A.s, will doubtless wait longer or give up waiting, for the "workers" have taken possession of the Ansaldo Aero Works at Turin, with its very fair aerodrome, and are using "Red" S.V.A. machines over Turin—when the Italian military aircraft from Mirafiori are not, chiefly. Apropos of which, one Turin daily accuses a "Red" pilot of neutral opinions, or at least high business instincts, in that he did mix with the subversive literature launched over the city certain leaflets anent a new ice-cream business there situated.

Swiss Reactionaries.

Two of the Savoia Company's pilots, Maddalena and Nanetti, each with a motorist and flying to deliver a machine to Stockholm, flew into trouble in Switzerland on the 27th ult., which country, by the by, is getting a very unpleasant name among the nations for aviator-baiting, as it did in years gone by with automibilists, to its ultimate sorrow.

Forced to come down, through fog and tempest, over the Gotthard range and consequent shortage of petrol, the two alighted safely on rivers fairly close to each other. Not expecting any such adventure, the one was in uniform, that of a captain in the Italian R.N., and minus, *on dit*, a Swiss *visé* to his passport; the other fell foul of some telephone wires and was detained till he paid for all the possible and probable damage to the national life of the Confederation, much as one used to have to do if one died in a Swiss hotel.

An Aviation Conference.

The big meeting held at Rome recently, where the Authorities and the Trade and those interested in aviation met and talked together freely, is considered to have been an excellent move. One believes it due to the Civilian Minister of War.

The Schneider Cup News.

A communiqué to the Press states that the eliminatory tests for the settling of which three of the five Italian entries shall represent the country in this race will be carried out on Sept. 12th. It also mentions three British and three French entries. Where is "America," as the U.S. call themselves?

An Italian Arrival.

On Sept. 7th a Savoia seaplane, probably one of the "9" series mentioned in your Italian correspondent's notes, piloted by Carlo Riva, and carrying Lieut. Erik Leyer, a Finn officer, as passenger, which had left S. Calende early in the morning crashed into the Lake of Zürich near Zöllikon, drowning both the two men on board. The machine was reported as being *en route* for Antwerp, and to have alighted on the Rhine near Ragaz on account of motor trouble. The weather conditions were most abnormal all over this part of Europe, but passengers on a lake steamer are stated by the *Corriere della Sera* of Milan, to have seen the seaplane break up in the air. This, however, is a common hallucination among the crowd on seeing a sudden change of direction.—T. S. H.

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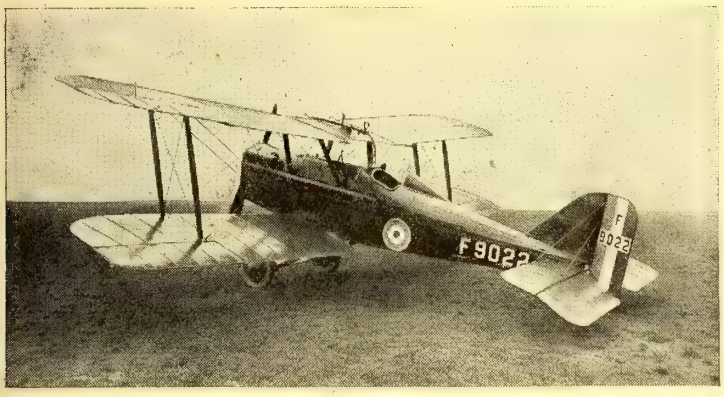
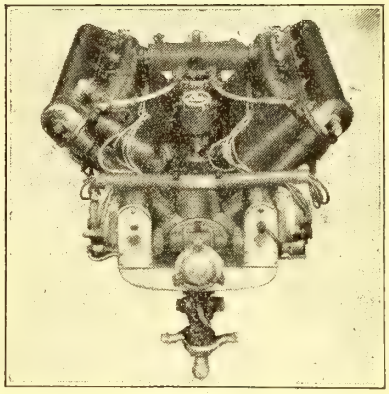
WOLSELEY VIPER 210 h.p.





THIS machine had the distinction of being retained in the Scouting services longer than any other type. It earned an enviable war reputation and was much favoured by several British Aces. Its stability and reliability are well known, and its manœuvrability is assisted by an adjustable tail plane which can be altered according to the varying loads carried. A high speed machine for long distance flights.

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JAPAN.

The following extract is taken from the Report of the Commercial Secretary to H.M. Embassy, Tokyo :—

Commercial Aviation.

This has made strikingly little progress in Japan, and the only actual performance which can be placed to its credit is a trial postal flight from Tokyo to Osaka and back in October, 1919. Three aviators (two of whom were civilians) competed for a prize, which was won by one of the civilians, who covered the outward journey in 3 hours 40 minutes and returned in 3 hours and 18 minutes. The distance between Tokyo and Osaka by air is about 250 miles.

The inauguration of an aerial post between the two principal cities has been proposed on various occasions, but its materialisation does not appear probable in the near future. Whether it is due to the absence or lack of good machines, or to want of training facilities for pilots, or to the mentality of the Japanese, it is a generally accepted fact that aviation remains in its infancy. However, the country is not without institutions for the encouragement of aviation.

The Imperial Aviation Association (Teikoku Hiko Kyokai), established in 1914 under the patronage of His Imperial Highness Prince Kuni and the presidency of Marquis Okuma, has a membership of over 5,000, but available funds are too small for operations on a large scale. This Association was admitted to the International Aviation Convention in June, 1919

Other bodies for the promotion of aviation are the National Aviation Society (Kokumin Hiko Kyolai), which is affiliated with the Imperial Association, founded in December, 1915, by a retired lieutenant-general, with the assistance of several prominent men and scientists interested in aviation. There are also aviation schools privately maintained, and in 1916 a Chair of Aviation was founded at the Imperial University at Tokyo.

Hitherto practical aviation in Japan has been fostered chiefly by the military authorities, although the Navy has not been idle. However, a considerable section of public opinion advocates increased attention to the possibilities of the seaplane in view of the lack of suitable landing grounds throughout the country.

Although strictly of military interest, it should be mentioned that in the early part of 1919 a French Air Mission, composed of about 60 aviators, including 17 officers, arrived in Japan for the purpose of training Japanese pilots at the military training schools at Tokorozawa, near Tokyo, and Kagamigahara, near Gifu. A small number of civilian aviators obtained the privilege of attending these schools during the French visit.

During the war two or three of the most famous American aviators came to Japan and gave exhibitions of trick flying; and at the present time preparations are being made to welcome Italian aviators who have actually started on their flight from Rome to Tokyo. In this connection it is interesting to note that a military air mission of 22 officers and over 70 mechanics was sent from Japan to the Italian front in the summer of 1918.

It will thus be seen that French, Italian, and American influence on Japanese aviation is an existing reality. It cannot be too strongly urged that British companies should lose no time in getting into this field and establishing agencies on sound lines, but it is essential that full precautions be taken in respect of the protection of patent rights.

SPAIN.

New Aerial Routes.

According to a statement made in Madrid on Aug. 24th, new aerial post routes will be created between the following towns: Seville and Larache, Barcelona and Palma-de-Mallorga, and Malaga and Melilla.

The aerodromes to be used at each point will be those belonging to military aeronautics. On the first of these routes there will be two intermediate landing-grounds at Lebrija and Vejez-de-la Frontera.

Ten aeroplanes will be employed on the first service, which will be daily. The second and third services will also be daily.

The aerial line from Barcelona to Palma, opened on March 18th, has not yet become a regular service.

SWITZERLAND.

The Swiss correspondent of THE AEROPLANE writes :—

The meeting of the Fédération Aeronautique now being held at Geneva was opened on Aug. 9th by the President, Prince Roland Bonaparte, who, with a few well-chosen words, thanked the Swiss Aero Club for having offered Geneva as the centre for this year's conference. The President of the Swiss Aero Club replied with a little French eulogy.

The following is a list of the various delegates present :—

Great Britain: Col. Mervyn O'Gorman, Col. McClean, Major Tindall Atkinson, and Commander H. E. Perrin. Belgium: M. Vleminkax. Spain: Com. Herrara. U.S.A.: Col. Jefferson de Mont Thompson, Sydney Veil, and Granville Tallock. France: MM. Surcouf, Lallemand, Blondel La Rougery, and Talamon. Italy: Signors Pralon, Crosti, Commandant Mercanti, and Ingenieur Pavia. Japan: Com. Masaru Murai Holland: MM. van den Berch and van Heemstede. Switzerland: Dr. Schneeli, MM. Duaime, Barbey, Borel, Meesner, Gerber, Badertscher, Haefeli, and Primard.

Many members of the Swiss Aero Club are assisting at the conference.

After the formal opening, Dr. Pittard read his report on "Aviation in 1919," stating extremely carefully whence he drew his conclusions. He traced the career of M. Henri Deutsch de la Meurthe, the sadly missed President of the French Aero Club.

The Federation then discussed the word "records," and, having decided not to homologate any records made since the war, they only retain the following under the title "performances" :—

Aviation.—Height (pilot alone), Roland Rohlffs (U.S.A.), 9,575 m. Sept. 18th, 1919.

Height (pilot and one passenger), Major Schroeder (U.S.A.), 9,699 m.

Speed (over one kilometre), M. Sadi Lecointe (France), 307.5 k.p.h.

Speed (over a closed circuit), M. de Romanet (France), 268.63 k.p.h.

Airships.—Duration, British airship N.S.11, 100 hr. 50 min.

Looping.—M. Fronval at Villacoublay, 962 loops in 3 hr. 62 min. 10 sec.

Thereafter followed a discussion between a British and a French delegate on the utility of a "looping the loop" record. The session then closed.

Geneva-Mont Blanc.

M. Durafour, after much argument with the Office Aérien at Berne, hopes to be able to start his Geneva-Paris service towards the end of September.

At present he is preparing for a flight from Geneva to Mont Blanc. Twice he has endeavoured to reach the dôme du Goûter, where he hopes to land, and which is just below the summit, but the atmospheric conditions and the soggy condition of his machine, a Caudron G.III (120 h.p. le Rhône), fitted with skis for landing on the snow, did not allow him to get sufficient height.

The machine is at present being overhauled and M. Durafour, accompanied by M. du Bochet, the promoter of the "stunt," hopes to make a successful attempt in the course of a few days.—J. J. H.

Another correspondent in Switzerland writes :—

Flying Boat Mishaps.

Italian flying boats seem to be having more than a usual patch of bad luck in Switzerland. Following Taddeoli's accident of some weeks back, about a week ago M. Oscar Bertia, who was not breveted for flying boats, took up two friends and presumably did a bad turn into the wind at Zürich, side-slipping into the lake. He and one passenger were drowned.

And now on the 7th, a Savoia, being delivered by air from Sesto Calende to Stockholm, broke in the air over Lake Zürich, both occupants being drowned.

[See Italian Notes.—Ed.]

A Handley Page in Switzerland.

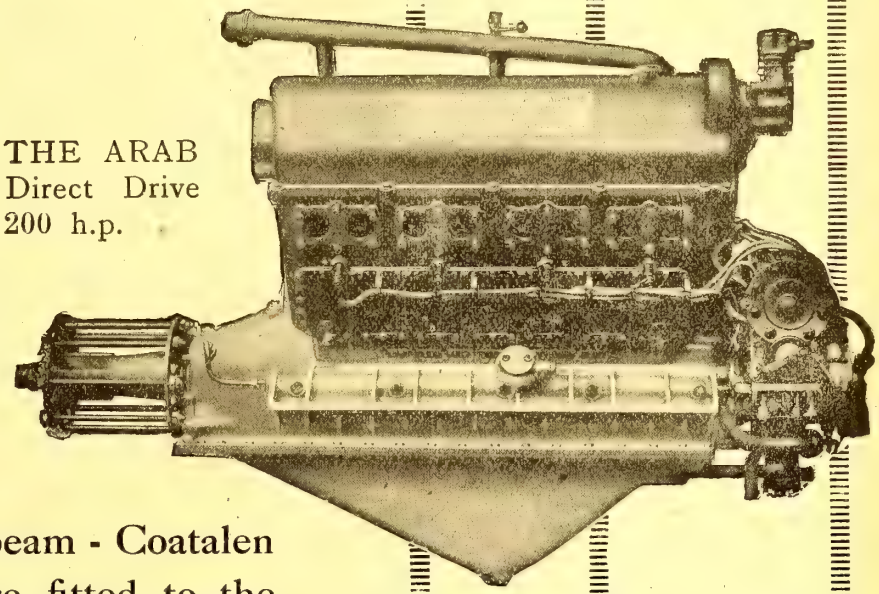
Handley Page O/400 G-EATL, piloted by Mr. Hope, has during its visit to Switzerland created a vast amount of interest and enthusiasm, much to the disgust of most Swiss people connected with aviation, some of whom possess some rather absurd prejudices against British aviation. Whilst at Lausanne on the Saturday afternoon, about 50 passengers were taken up on five flights, the last one being with 13 on board. On Sunday morning, in spite of low cloud and rain, the machine left for Neuchâtel (Planeyse Place d'Armes) with seven passengers. It appears that at this place a curious down current exists at the entrance of the Val de Travers. In getting off, on the one and only occasion it was attempted for passenger carrying, Hope, with both engines going full out, sank in a hair-raising pancake, and only by sheer good flying did he manage to get over the tops of the trees and houses, out over the lake where he was able to get a little height. He wisely decided not to take any more passengers, so the machine was handed over to the visitors to view the innards at three francs a time, and according to the mechanic's plaintive assertion, "the cabin floor is now only one-ply!"

The machine was flown back to La Blécherette on Monday evening, and on Tuesday 10 passengers went up for half-hour flights.

The advent of the Handley Page has made a little business for the Avro belonging to the Ad Astra Co., as many people don't like being shut up in a cabin. Within a week the Avro took over £45 in flights of from 10 to 20 minutes' duration.

The Handley Page was due at Geneva on the 10th, and Dubendorf military aerodrome on the 13th. It appears from events so far that for slow and heavy machines the atmospheric conditions of Switzerland cannot be ignored.—E. B.

SUNBEAM-COATALEN ENGINES



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THE ROYAL AERONAUTICAL SOCIETY.

FINANCE.

The half-yearly audit has just been completed, and the accounts show, as was anticipated, a deficit approximately equal to the amount of subscriptions outstanding. It is hoped to publish the balance-sheet in an early issue of the Journal.

LECTURES.

The following course of lectures to the Students of the University of Sheffield has been arranged in response to a request from the Vice-Chancellor :—

October 21st.—"Notes on the Inspection of Aircraft Steels," by Brig.-Gen. R. K. Bagnall Wild, C.M.G., C.B.E.

October 28th.—"Aircraft Drop-forgings," by Dr. L. Aitchison, A.I.C.

November 4th.—"Case-hardened Steels and some Defects met with during Inspection," by Capt. W. A. Thain.

November 11th.—"Cold-worked Aircraft Structural Steels," by Dr. L. Aitchison, A.I.C.

November 18th.—"Materials for Aircraft from the Point of View of the Designer," by A. J. Rowledge.

November 25th.—"The Economical Use of Steel in Aircraft," by A. A. Remmington.

Two popular lectures are also being arranged on November 4th and February 24th, 1921, in the Central Library, Fulham, at the request of the Chief Librarian.

AIR CONFERENCE.

In response to a request from the Air Ministry arrangements are being made for the reading of a paper on "The Technical Aspects of Service and Civil Aviation," by a Member of the Society, at the Air Conference to be held at the Guildhall during the third week in October.

ELECTION OF MEMBERS.

The following members have been elected to the Scottish Branch :—

Members.—W. Sholto Sheppard, R. G. Leckie.

Student.—A. MacFarlane Cairns.

W. LOCKWOOD MARSH,
Secretary.

Sept. 10th, 1920.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Sept. 7th.

ROYAL AIR FORCE.—FLYING BRANCH.—Flying Officer H. L. Rough, D.F.C., is placed on the half-pay list (Scale A.), from Dec. 3rd, 1919, to March 31st.

MEDICAL BRANCH.—Flying Officer G. H. H. Maxwell to be Flt. Lt., Aug. 23rd.

MEMORANDUM.—Wing Cmdr. M. G. Christie, C.M.G., D.S.O., M.C., is restored to the active list, Sept. 10th.

AIR MINISTRY, Sept. 10th.

ROYAL AIR FORCE.—MEMORANDUM.—Flt. Lt. R. S. Sugden, A.F.C., is placed on the half-pay list (Scale B), Aug. 13th.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATHS.

SHELDRAKE.—Lieut. A. T. Sheldrake, 7th H.L.I. and R.A.F., who was reported missing on Sept. 28th, 1918, is now presumed to have died on or since that date. He was the eldest son of Charles H. Sheldrake, "Moniaive," Grahamshill, Airdrie.

VEREL.—Lieut. Julian Rudolf Verel, R.A.F., who died on Sept. 8th at Perth, Australia, was the younger son of F. B. Verel, Brooke House, Norwich.

ENGAGEMENT.

BIGWOOD—LINDNER.—The marriage of Wilfred Bigwood, son of Mr. E. J. Bigwood, The Berrow, Barnt Green Worcestershire, and Stephanie Gertrude, widow of Lieut. P. E. Lindner, R.A.F., and daughter of Mr. and Mrs. H. S. Baldwin, Ashbury House, Warwick, will take place quietly at the Cathedral, Birmingham, on Sept. 30th, at 11 o'clock.

BIRTH.

BRIGGS.—On Sept. 8th, at 7, Portsdown Avenue, Golders Green, N.W., to Violet (*née* Long), the wife of Wing Commander E. F. Briggs, D.S.O., R.A.F., of a son.

EMPLOYMENT.

[Except where addresses are given, communications should be sent c/o THE AEROPLANE, 175, Piccadilly, W.1.]

Suitable employment wanted for man who has filled positions of ship's clerk, wharf foreman, dock and wharf representative.—P. W. H.

COMING EVENTS.

SEPTEMBER.

18th, Sun., 19th, Mon.—Schneider Cup Race at Venice.
27th, Mon.—Gordon Bennett Cup Meeting at Etampes begins.
28th, Tues.—Gordon Bennett Cup Race at Etampes.
Last week.—Latvian Trade Fair, Riga, opens.

OCTOBER.

2nd, Sat.—Gordon Bennett Cup Meeting at Etampes closes.
7th, Thurs.—R.Ae.S. lecture. "Civil Aviation," by Major-Gen. Sir F. H. Sykes, G.B.E.*
8th, Fri., 9th, Sat., 10th, Sun.—French Aviation Meeting at Buc.
21st, Thurs.—R.Ae.S. lecture. "A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Sqdn. Ldr. R. M. Hill, R.A.F.*
23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.
23rd, Sat.—International Aero Exhibition, Prague, opens.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes.
2nd, Tues.—International Aero Exhibition, Prague, closes.
4th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo.*
18th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*

DECEMBER.

2nd, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*
16th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*

JANUARY—1921.

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology," by G. Dobson.*
17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

MARCH—1921.

3rd, Thurs.—R.Ae.S. lecture. "Airship Fabric," by J. W. W. Dyer.*
17th, Thurs.—R.Ae.S. lecture. "Flying-Boat Construction," by Capt. D. Nicolson.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30.

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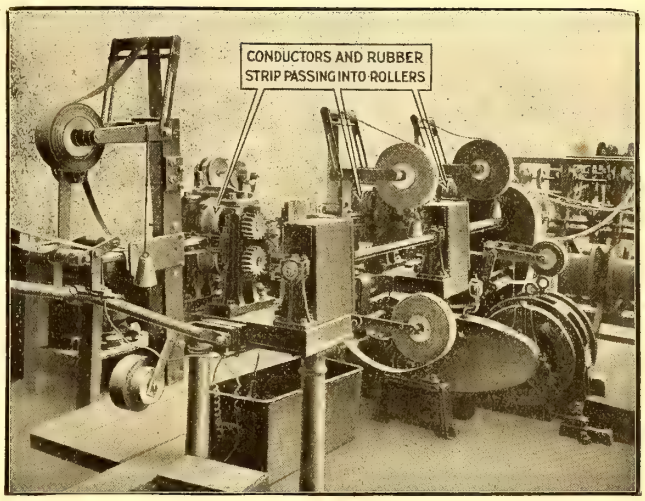
In the making of V.I.R. Cables.



it is obvious that the most important process of manufacture is the application of the rubber to the connection.

This operation follows the preparation of the wire by the tinning process described in an earlier issue, and the calendering of the rubber into suitable sheet, as also previously described.

This sheet, after calendering, is cut into strips, and rolls of such strip will be observed mounted on the machine we illustrate above.

This is technically known as a Longitudinal Rubber Covering Machine, and takes a number of conductors, with a strip of insulating rubber above them and a similar strip below. These pass simultaneously between two case-hardened steel rollers, which are accurately grooved to suit the size of the conductors and the thickness of the rubber.

The pressure of these rollers, and the sharp cutting edge between their grooves, force the rubber strips to adhere closely to the conductors and to one another, and at the same time, separate the various conductors.

Each conductor thus emerges from between the rolls in a closely adherent and practically seamless tube of rubber, and the same process is repeated for the second and third layers.

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This type of Covering Machine is the type in practically universal use for covering wires with pure and high-grade rubber, and, of course, is quite distinct from that largely employed on the Continent for the production of low-grade wires and cables, and known as a Forcing Machine. The latter squirts the rubber mixture on to the cable, and it will, of course, be obvious that such a process is quite inapplicable to cables having a layer of pure rubber

Finally, it should be noted that the Machine here illustrated is another of our own design and manufacture; it is driven by its own Electric Motor through suitable reduction gearing, and, as evidence of its value and the wide appreciation thereof, we would place on record the fact that we have supplied exactly similar Machines to many of the leading Cable Makers in this country and throughout the world.

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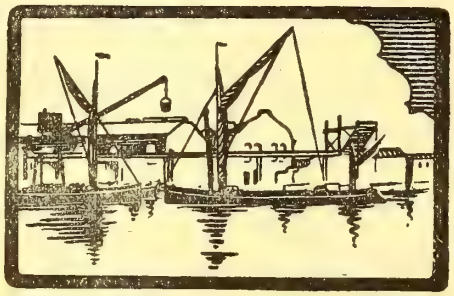

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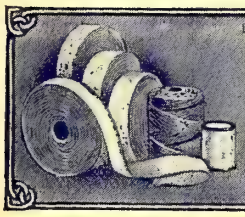

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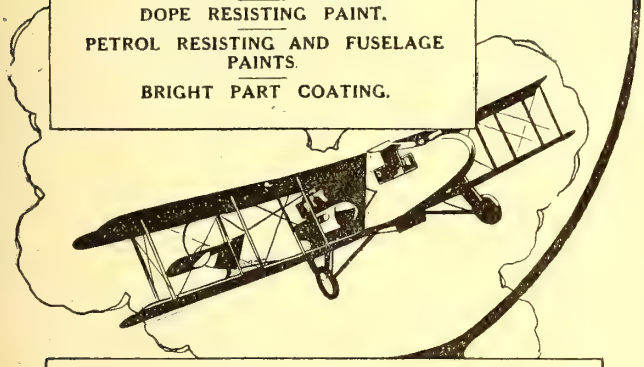

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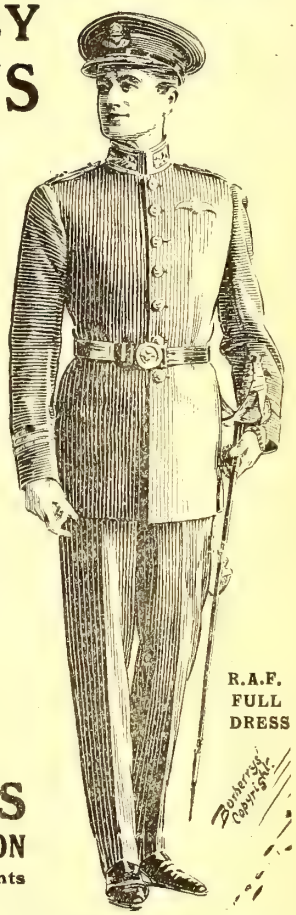

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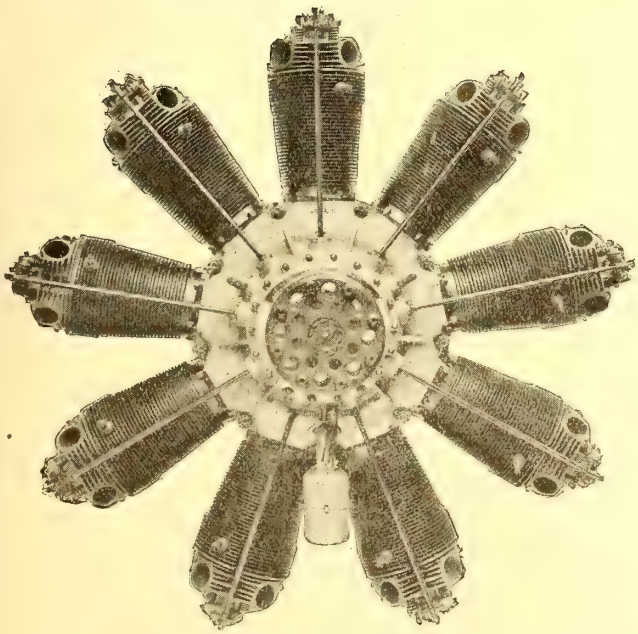

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ON THE GORDON BENNETT RACE.

It is satisfactory to learn that Mr. F. P. Raynham and Mr. R. McGeagh Hirst have safely arrived at Etampes with the Martinsyde Gordon Bennett Racing Machine, and that the machine is now being got ready for test.

It is even more gratifying to learn that there is still a prospect of Great Britain being represented by three machines. A little private syndicate composed of sporting members of the Royal Aero Club have arranged to buy the Sopwith Gordon Bennett machine (late Schneider Cup machine) from the liquidators of the Sopwith Company, and if all is well it will be fitted with the Bristol "Jupiter" engine for which the front of the machine had been altered in preparation for the race.

Sir Stanley White, Bart., and Mr. Roy Fedden, of the Bristol Company, have behaved in a thoroughly sportsmanlike manner, and though work on the engine had been stopped owing to the liquidation of the Sopwith Company and the cancellation of the entry for the race, work was started again on Monday, and at the time of writing there is every prospect that the engine will be ready to put into the machine by the time this paper appears.

The sportsmen who are responsible for this effort are, so far as one can gather, Lieut.-Col. Frank McClean, Mr. Handley Page, Mr. Wallace Barr, Mr. Harry Knox and Mr. Harold Perrin, the last-named in his personal capacity and not as Secretary of the Club.

If all goes well the machine should arrive at Etampes by Saturday, and it will be flown in the race by Capt. Jordan, who flew Col. McClean's "Snipe" so well in the Aerial Derby. Everyone will wish success to this sporting effort, and it is to be hoped that even if the "Syndicate Jupiter" biplane does not win the race it will put up a good show, just by way of rewarding those who have shown that the spirit of British sportsmanship still exists among the members of the Royal Aero Club, even if the sport of flying does not appeal to our capitalists.

What with the Soviet workmen in Italy tuning up the Italian machines for the Schneider Cup Race—as recorded by Mr. T. S. Harvey in the Italian Notes this week—and the *bourgeois* members of the Royal Aero Club paying out of their own pockets for the third British representative in the Gordon Bennett Race, one is really beginning to acquire faith in the future of the Sport of Flying, for it must be remembered that all great movements, religious and otherwise, start in the lower grades of society and work their way upwards. Thus in time we may see our war profiteers, peace profiteers and members of the higher grades of the Order of the British Empire, taking a real interest in the Sport of Flying.—C. G. G.

ON THE AMPHIBIAN COMPETITION.

So far nobody could claim that the Amphibian Competition has been a success. Up to the end of last week only three competitors had turned up, namely, the Vickers "Viking III" (450-h.p. Napier), the Fairey (450-h.p. Napier) and the Supermarine (375-h.p. Rolls-Royce). The Beardmore and the Saunders "Kittiwake" were not completed. Consequently, it hardly seems likely that the Committee of Judges will award the full sum offered as prizes originally.

Incidentally it is rumoured that the said Committee does not intend to award the full sum offered as prizes for the Aeroplane Competition, but whether this decision is due to lack of numbers, lack of originality, or lack of progress is not commonly agreed. Still, one has no doubt that the Judges' Report, when issued, will make the decision perfectly clear, for all the judges are men who have the habit of speaking their minds without fear or favour, and what they do not know from bitter experience about aeroplanes and seaplanes is not particularly well worth knowing.

It is customary, as, for example, in the matter of claims against the Government for bounties or royalties on inventions, or for compensation, or for pensions or whatnot, to complain that the tribunal appointed by the Government is incompetent because it is not composed of experts. Such complainers fail to recognise the fact that the only person who can be utterly unprejudiced is the man who has no technical knowledge and who merely weighs the evidence as it is put before him. In the case of the Air Ministry Competition the chief complaint of the competitors is likely to be that the Judges know too much, and therefore are liable to expect more from the designers and constructors than either are able to perform under existing conditions of business and finance.

Still, the more the Judges expect the more the Trade will perform, if not in this Competition at any rate in the next—whenever it may be. There is much to be said for the American aphorism: "Hitch your wagon to a star." And if the Trade does not perform up to the Judges' expectations then the Judges are right in exercising their right to reduce the amount of the prize money, on the good old English principle, so much admired by Napoleon, of shooting a few people "*pour encourager les autres.*"

Nevertheless, even if such be the decision of the Judges there is not likely to be any grumbling among the competitors on the spot, whatever there may be among Directors and such people at home, for there has certainly never been a competition in which the contestants and the Judges were on more friendly terms than in this, or in which the judged had more respect for the knowledge and impartiality of those who judge them.

The Humours of the Competition.

Considered as a jolly little holiday, the Amphibian Competition is even more enjoyable than the Aeroplane Competition. Owing to the small number of competitors, it partakes more of the nature of the *théatre intime*. It is as, say, the Little Theatre to the Coliseum (where the Christians used to feed the lions, not to be confused with the Trocadero where the Lyons of to-day feed the

Christians) though without the Grand Guignol thrills with which the Little Theatre now entertains its patrons.

The fact that all the competitors treat the affair as a very good joke does not in the least prevent them from competing very seriously, and working very hard to get the best out of their machines. Up to the end of last week none had done any of the water tests as they all wanted to get through their land tests before chancing having their machines damaged by awkwardly handled launches in the mooring and towing tests or by a sudden squall in the 24 hours' mooring-out test.

Wherein they showed their wisdom, for all the competitors know how to make a hydroaeroplane perform on the water, whereas the land tests are still very much of the nature of experiments. Also, the machines are more likely to do well when flying off land if they have not had a few dozen pounds added to their weight through having been previously soaked for a day or two in salt water.

Nothing would induce them to face the water tests first. One of the Judges, famed for his constructive humour, suggested that extra marks should be given for the number of fish caught by the caretaker of each machine during the 24 hours' mooring-out test and for cooking facilities on board. This, he argued, would demonstrate the ability of the machine to be self-supporting if brought down at sea. Even this proffered inducement failed to persuade the amphibians into the water.

Their reluctance reminded somebody of the pictures of "Pip and Squeak" being chased into the sea as an advertisement. Somebody else said that they reminded him of the schoolboy's definition of an amphibian animal as a "beast that can't live in the water and dies on dry land."

For the matter of that there has not been much dry land even on Martlesham Heath of late. On Thursday, after a morning's rain, the Adjutant's pet grass-plot, with its neat border of white stones and ropes and posts, and white bombs at the corners, and the flagstaff in the middle, looked like an ornamental pond and gave a truly nautical air to the flagstaff and the little warship at its base.

The "Superhumans."

Still everybody seemed remarkably cheerful. The Supermarine crew, known to everybody at Martlesham as the "Superhumans," remained true to their marine traditions, and their entry at meal-times to the Hostel, clad in heavy jerseys, and grey trousers tucked into big sea-boots, positively brings the ocean breezes with it. It was not surprising that when they first arrived somebody looked up and remarked, "Hello! Here comes the fishing fleet," and a wag in the corner chortled, "Any more for the *Skylark*?"

It remained for Captain Hoare, the pilot, to supply the proper amphibian touch by wearing a Norfolk jacket and a tweed shooting hat on top of his fisherman's rig. Somebody suggested that the jacket and hat were worn as a compliment to Colonel Pretyman's shooting rights over Martlesham Heath, but somebody else laughed the idea to scorn, on the grounds that people don't shoot over the Heath in these days, they snare.

En passant, one may remark that the Air Ministry has conferred on the Supermarine the registration letters G-EAVE. A visitor seeing this remarked that he was under the impression that aeroplanes were not allowed to carry advertisements on their sides in this way. One of those present pointed out that they were registration letters and asked where the advertisement came in.

To which the visitor replied: "Oh! I thought it was the name of that outfitter bloke in Bond Street who trusts all the young Naval officers for their uniforms And I thought perhaps he had supplied these Supermarine chaps with their maritime get-ups in exchange for the advertisement." And then it was explained to him that the good Gieve does not spell his name that way, although he may be a super-marine-outfitter.

The "Vikings."

The marine rig of the "Superhumans" evidently roused the envy of the "Vikings," Captains Broome and Cockerell, a priceless pair, who are probably the funniest thing seen on any stage since Humpsti and Bumpsti were interned at the beginning of the war. They, having beaten all records in the land-machine competition by getting off over the screen at a height of 75 feet, or something of that order, and by doing a high speed of 121 miles an hour, were naturally entitled to "put on edge," and resented the assumption that the Superhumans were the only sea-going people in the Competition.

Consequently they bought two little sailor hats, with white tops and black bands, of the kind worn by small boys with their Sunday sailor suits. And then they painted "Viking III" in gold on the black bands. So now when they go to take the air in their amphibian, they go aboard, pull their little caps from under their seats, adjust the little elastic under their chins, and smile sweetly like Little Lord Fauntleroy for a few minutes before putting on their proper flying kit and starting business.

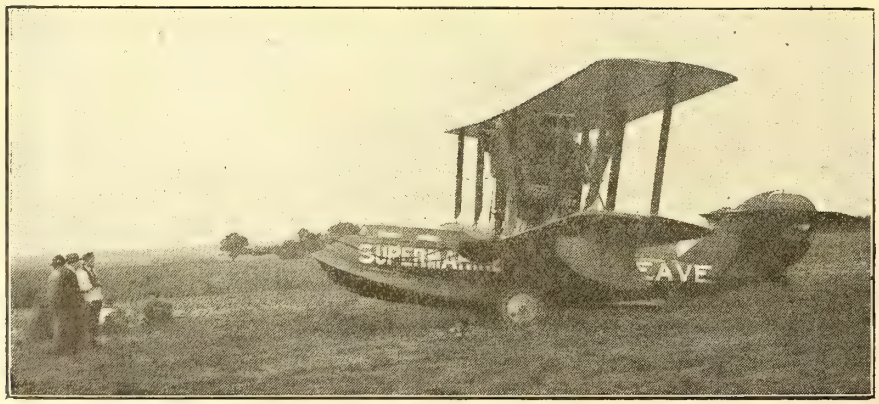
When they do start they are wonderful, but observers say that they are rather terrifying, in that having made a perfect "get-off" they are somewhat apt to start fighting as to who is and who is not going to control the machine. And two pilots pummelling one another vigorously over the controls is apt to make the machine rock a bit, which is disconcerting at 300 feet or so. However, Mr. Pierson's design seems to have given the machine plenty of inherent stability, and the antics of the pilots do not appear to affect its behaviour.

The Fairey.

The "Fairey" began her tests on Friday, when Lieut.-Col. Vincent Nicholl, D.S.O. (twice), and sundry other decorations, did the 3½ hours' durability test. It was a brilliant morning early, but towards mid-day it became wet and squally, and when the Fairey landed the gusts were very bad indeed. Nevertheless, Col. Nicholl put the big machine down beautifully so that after her first touch she never showed daylight between her floats and Colonel Pretyman's heather, though the pilot himself was far from pleased and apologised for doing a bumpy landing.

He need not have apologised, not even to his two observers, who were far too air-sick to bother whether the machine merely bounced a bit or crashed altogether, provided they got onto solid ground again. Colonel Nicholl himself, the most utterly imperturbable person on earth or in the air, never having known the feeling of seasickness or airsickness, in spite of spending three days on the North Sea in a shot-down flying-boat and of having chased a Zeppelin to Helgoland on a B.E.2c. without flotation bags, wanted to look at his old haunts, so he flew up the coast to Yarmouth, to see his beloved station falling to pieces, and on to the Wash, just when the bumps were worst.

And while the passengers were recovering from their upheavals the pilot sauntered in to lunch as though he had



THE SUPERMARINE AMPHIBIAN.—A side view of the Supermarine G-EAVE, with 375-h.p. Rolls-Royce engine. The curious arrangement of tail-fin and fins between the interplane struts is of interest. The cabin-top for the passengers is noticeable. The pilot sits in an open cockpit just behind this. In the group on the left is to be seen Squadron Commander James Bird, in a white jersey, one of the moving spirits of the firm.

merely been taking a stroll down Bond Street. Incidentally one hopes one has not committed a libel by asserting that the two passengers were airsick. One does not know who they were, but one hastens to assure everybody that they are both very gallant officers who served with distinction in every war area to which duty called them, and won whatever decorations they may or may not wear by acts of conspicuous bravery. And one hopes that they will both be awarded the Air Force Cross for acting as observers on this occasion.

Getting Off.

Apropos the Fairey, rather an amusing yarn is told. Colonel Nicholl brought the machine round from Hamble to Felixstowe over the sea and alighted at the latter place before coming on to Martlesham. About the time when he was expected at Martlesham some people standing outside the secretary's office heard a voice within repeatedly and vociferously enquiring of Felixstowe Air Station, "Has the Fairey got on at Felixstowe?"

A quarter of an hour or so later a car came in from the Felixstowe end of the aerodrome, driven by an aviator who has nothing to do with the Fairey machine, and with the pilot in the car was a very elaborate damsel. As the car dashed past the office one of the group remarked quietly, "Evidently the fairy *did* get off at Felixstowe."

ABOUT THE MACHINES.

The "Viking III."

The description of the machines themselves is the affair of the technical section of this paper, and as they have arrived so variously at Martlesham it has been impossible as yet to compile a detailed account of them. Nevertheless, a few notes on their main features may be permissible in this article.

The "Viking III" is to all intents and purposes the same as the machine which won so much favourable comment at the Olympia Show and did so well at Antwerp. But for this competition the engine is a 450 h.p. Napier instead of a Rolls-Royce. The extra 100 h.p. seems to explain her very fine performance.

The landing gear is the same as at Olympia. The breakages which have caused so much delay occurred in the phosphor bronze castings which act as the pivot on which the landing gear is swung into and out of action. When this casting went the left wheel splayed out and tore the claw-like fitting below the axle away from the flange along which it runs. Consequently the machine sat down on its bottom and the left wing-tip float. The boat itself shows no sign of damage, which speaks well for the design and for the strength of "Consuta" ply-wood

Her performance on the water after her strenuous experiences on land will be watched with interest. Meantime, as an aeroplane she is evidently of very high class and Mr. Pierson, her designer, deserves every congratulation on her performance.

The Supermarine.

The Supermarine is also a flying-boat with a landing carriage, the boat being exactly similar to that which was shown at Olympia. In this case the carriage is hinged on each side of the hull, and when out of action is drawn up and outwards by cables so that the wheel on each side lies flat under the corresponding lower plane. When in action it is drawn down by cables and the undercarriage struts lock automatically into spring sockets on the side of the hull.

The engine is an "Eagle" Rolls-Royce, which seems a trifle low-powered for the load which it has to carry. Compared with any ordinary seaplane performance it would doubtless be ample. But modern aeroplanes have accustomed us all to seeing land machines rocket off the ground instead of flying off steadily and so perhaps the idea that the Supermarine is under-powered is more or less an illusion. Also, Captain Hoare is essentially a boat pilot and flies her boat fashion. That is to say, he does not hoick her off the ground, but lets her fly off on her own initiative, which is probably much safer in the end.

Like all Supermarine products, the machine shows plenty of brain work. The way in which the engine-bearers are braced against airscrew torque, with a strut on one side pushing against the pull of a cable on the other is simple and ingenious, and so is the king-posting of the engine-bearer on the "down" side.

The boat itself is, as usual, a thorough marine job, full of those little gadgets and notions which attracted so much attention at Olympia and impressed everybody with the fact that the Supermarine people do know what they are doing with water-going craft. It strikes one that the wheels and undercarriage struts slung up under the wings may interfere with manœuvring on the water at low speeds, as these boats float very low. But when once she is up on her step, when seriously starting to fly, there is no doubt that she will behave well.

The Fairey.

The Fairey is a more or less standard Fairey seaplane, but with a 450 h.p. Napier engine, and with a pair of elevatable wheels placed between the floats. The job, like all Fairey jobs, is thoroughly well done.

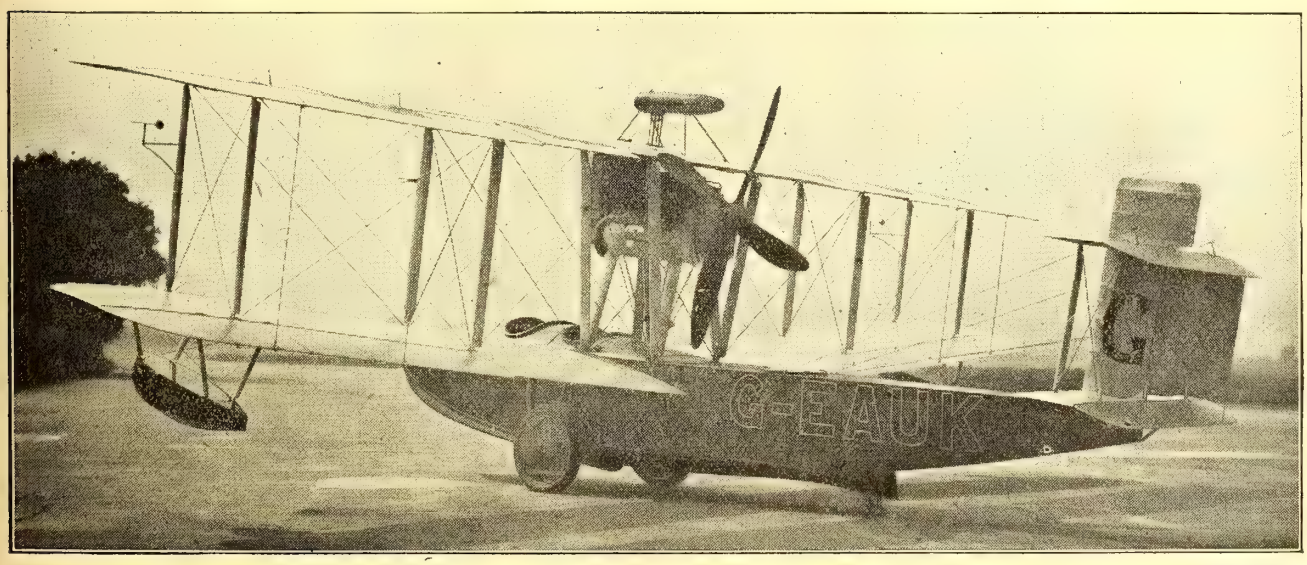
Being, as an amphibian must almost inevitably be, a compromise, the undercarriage struts appear to have been cut down shorter than they would be on a seaplane, with the result that the tips of the big airscrew needed by the Napier come very close to the floats. Which means that they would be very near the water when afloat and so might suffer in getting off a lumpy sea.

To have made the struts long enough to avoid any such risk would have meant that when standing on her wheels on land the front of the fuselage would have been somewhere up in the roof of any ordinary shed. The assumption is that the machine will not be used in a rough sea, except by accident, her proper function being to take her passengers up from a river or lake or harbour in the middle of a big city and fly them across the country to another alighting place on water.

For example, amphibians would be used for services from the Thames to the Mersey, or on the Clyde, Forth, or Tyne. Regular sea services would be worked by sea-going flying-boats or big float machines.

Real Progress.

On the whole, though amphibian aeroplanes are admittedly still very much in the experimental stage, these three machines do most distinctly show real progress in the design of heavier-than-air craft. It is true that one would have liked to see something new in wing design, as for example in the German Dornier boats and the later Brandenburgs, with their



THE "VIKING III."—Three-quarter Rear View of the Vickers "Viking III" with Napier Engine.

all-metal cantilever wings. But in this instance it is the amphibian alighting arrangements which are the subject of test, and so perhaps the designers were wise to adhere in the matter of wings to the old proverb "Better the Devil you know than the Devil you don't know."

It is a pity that it has not been possible to complete the Saunders' "Kittiwake" in time for full tests before the trials, for her wings, built entirely of "Consuta," and with both variable leading edge and variable trailing edge, would have certainly been of great interest. So would her "Bat-boat" hull, with a fuselage instead of tail-booms on top, and her wheels which disappear inside the hull. In this machine Mr. Saunders and Mr. Beadle have gone "all out" for progress, and one hopes to be able to record the success of this ambitious effort ere long, though one fancies that the two A.B.C. "Wasp" engines are hardly big enough to carry the load.

Meantime the three competitors now at work at Martlesham—and by now, one hopes, at Felixstowe—have undoubtedly contributed to the progress of Civil Aviation. They deserve credit, at any rate, for having made a good sporting effort, and one hopes that they will each receive a substantial reward for their enterprise.—C. G. G.

THE LATEST TESTS.

[On Sept. 14th the Vickers "Viking III" did her slow-speed test, doing a speed of 45.25 knots. Her high speed, done the previous week, was 105.2 knots (121 miles per hour).

In the "get-off" test she rose to 94 feet over the screen from a 275-yard circle, which equals 177 feet from a 400-yard circle.

On Sept. 20th the "Viking" did her taxying, figure-of-eight, and mooring tests, and was then tied up for the 24 hours' mooring test.

On Sept. 17th the Fairey did the 3½ hours' trial, but owing to the bumpiness of the air, which made it necessary to keep the engine going at almost full power for considerable periods, Colonel Nicholl applied for a second test as a check on the petrol consumption This second test was made on Sept. 20th, and on this occasion the W/G figure of the Fairey worked out at 8.5.—C. G. G.]

THE F.A.I. CONFERENCES.

[The following notes on the Geneva conference of the F.A.I., held on Sept. 8th, 9th, and 10th, 1920, have been contributed by Mr. Harold E. Perrin, Secretary of the Royal Aero Club, one of the British delegates.]

Several matters of general interest arose during the course of the Federation Aeronautique Internationale Conference in Geneva on Sept. 8th, 9th and 10th, 1920. For example, the difficulty which aviators have experienced in connection with any long-distance trip in getting maps which indicate even roughly the situation of landing-places and aerodromes was felt so strongly that it was decided in advance of the projected action of the International Convention, which may be delayed indefinitely, to produce a preliminary series of maps in an international guide book.

AN AERODROME GUIDE.

The British delegates were fortunate in being able to submit a "format" of the proposed "Guide to Aerodromes in the British Isles," with examples completely worked out which might form a basis for the series. This "Guide Book" was considered by the Federation Aeronautique Internationale to be so well done that it was proposed to repeat it as far as possible for all countries. The book in question was prepared by the Air Ministry, Civil Aviation Branch, in co-operation with the Society of British Aircraft Constructors and the Royal Aero Club. Col. Mercanti (the President of the Italian Touring Commission) undertook to defray the expenses of the publication of the first issue, which he hoped would appear by next May. It is obvious that this preliminary guide will require bringing up to date from year to year.

CLAIMS FOR THIRD-PARTY DAMAGE ABROAD.

The case of a flier who might find himself held up by reason of claim for third-party damage in a foreign country was considered, and it was proposed that if he were a member of a club belonging to the Federation Aeronautique Internationale, the club of the country in which he finds himself should take upon itself to free him from detention by paying the claims, if reasonable, and reimbursing itself from the club of the flier subsequently. The whole scheme would, it is proposed, be covered by an insurance to be effected by each of the federated clubs. This proposal was referred to a special Law Committee for consideration and report to the next Meeting.

THE MATHEMATICS OF STABILITY.

A desire having been expressed that the various symbols used in discussions on the mathematics of stability in the various countries should be understandable universally, it was agreed that a standardised code of symbols should be adopted, and in this matter the British delegates were able to bring forward the system published in the "Glossary of Aeronautical Terms" for which the Air Ministry and the Royal Aeronautical Society are jointly responsible. This Glossary was provisionally adopted subject to the French translation of the Glossary being submitted to discussion by the various countries concerned.

THE MERCATOR SYSTEM.

It was suggested that the Mercator system of map projection should be abandoned in favour of an alternative scheme, but this was opposed by the British delegates, in view of the existing international agreement and the useful outcome of the discussion was that all clubs should concentrate in supporting the employment of maps to the agreed standard scale as laid down in the International Air Convention (Annexe "F").

A RESUME OF AERONAUTICAL STATISTICS.

The resumé of Aeronautical Statistics during the War, which was undertaken by the F.A.I. in 1919, has progressed considerably in the hands of the French editor to whom it was entrusted, and who had circularised all clubs with a heavy series of questions. The British delegates, with the assistance of the Air Ministry, gave a valuable series of replies, which were handed in at the Conference, and it was reported that six other countries had also sent in useful and full information.

THE PILOT'S CERTIFICATE.

The British delegates reported that the British Air Ministry accepts the Royal Aero Club's Certificate for Class "A" brevet (Pilot's Certificate), and it was agreed that the brevet of the International Convention should be adopted by the Federation Aeronautique Internationale as to Section 1 for Aeroplanes; Section 2, Balloons; and Section 3, Airships; thereby standardising the tests for all countries—Allied, neutral, or enemy.

The British delegates put forward a proposal that the Federation Aeronautique Internationale should also adopt a "Superior Brevet" for holders of the existing Federation Aeronautique Internationale Certificate, the Superior Brevet to include various useful feats in aerobatics. The British proposal was, in principle, accepted, and the details were to be circulated to the clubs for discussion at a future meeting.

THE AERIAL DERBY AROUND THE WORLD.

The draft scheme for the Aerial Derby Around the World put forward by the Aero Club of America was not considered suitable for discussion in the form submitted, and it was agreed that the French Sporting Commission should draft a proper series of rules for submission to all clubs.

SIGNALS.

The unification of signals as set out in the International Convention was adopted, but the various clubs were invited to send in any additional suggestions.

COMPULSORY APPARATUS.

The unification of compulsory apparatus to be carried on aircraft was left for the International Convention to decide upon.

THE TECHNICAL COMMITTEE.

The following questions were referred to the Technical Commission for report:—

(a) To collect information as to results obtained on wireless telephone and telegraph communication from the air.
(b) To report on the adoption of standardised parts of material on the lines laid down by the British Engineering Standards Association.
(c) To report on the value of writing the names of villages on the roofs of stations and on any scheme of international airways for the common adoption for long itineraries.

THE OFFICIAL REPORT OF 1919.

In the official report of 1919 proposed to the Conference for adoption there was allusion to a sensational sequence of 722 loopings effected in three hours. It was urged by the British delegates that no official provision existed in the F.A.I. for taking note of such aerobatic feats, and they should not properly be called records in the sense in which the word "Record" was used by the Federation Aeronautique Internationale. It was agreed that while the statement had interest, the word "Record" should not be used.

The above few notes by no means represents the work of the Conference, but gives indication of some matters of more general interest which were touched upon.

The British Delegates, representing the Royal Aero Club, were Lieut.-Col. M. O'Gorman, C.B., Lieut.-Col. F. K. McClean, A.F.C., Major E. H. Tindall-Atkinson, and Lt.-Comdr. H. E. Perrin.

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THE following is a typical Press comment on the Government trials at Martlesham:—

"It will be observed that both machines have Napier Engines. Both scored heavily in the economy test, one of the factors undoubtedly being the lightness of that engine in relation to its power."

Daily Telegraph, 30/8/20.

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NAVAL AND MILITARY AERONAUTICS.

The R.A.F. Appointments and Gazettes will be found on page 570.

NAVAL.

MOVEMENTS OF SHIPS.

Aden, Sept. 14th.—*Ark Royal* arrived.
Aden, Sept. 14th.—*Ark Royal* left for Basra.

MILITARY.

EXTRACTED FROM WAR OFFICE COMMUNIQUES.

Sept. 15th.—Baghdad-Hit Area.—. . . . A hostile encampment of the Zoba tribe was successfully bombed on Sept. 12th by our aeroplanes.

UPPER TIGRIS.—Insurgent gatherings near Samarra have been effectively dispersed by our aeroplanes.

Sept. 16th.—Upper Tigris.—On Sept. 7th the Civil Commissioner, Baghdad, visited Suleimanie by aeroplane. . . .

Sept. 17th.—Upper Tigris Area.—During an aerial reconnaissance from Mosul small parties of mounted Kurds were bombed and dispersed. . . .

Sept. 18th.—Upper Tigris.—The district around Akra is reported as unsettled. Aerial raids have been carried out on Sharmin, north of Akra, and Kalata, N.E., on border.

Sept. 20th.—Middle Euphrates.—On Sept. 17th. . . . Aerial reconnaissances over Kufa (beleaguered garrison) observed a request for tobacco and cigarettes painted on a roof, from which it can be inferred that supplies of necessaries and ammunition are satisfactory.

Baghdad-Hit Area.—. . . . It was reported that Sheikh Dhari, the truculent Sheikh of the Zoba tribe, was located 25 miles north-west of Baghdad with a following and 1,000 camels. We inflicted a considerable number of casualties both in men and camels by means of aerial attack. . . .

Upper Tigris.—. . . A reconnoitring air raid was carried out on Sept. 16th against two villages east of Tuz Khurmatli, where insurgents have been harboured who are continually damaging telegraph lines.

N.W. Persia.—Persian Cossacks report that a Bolshevist aeroplane on Sept. 17th dropped four bombs on Imamza.

The North Persian Front.

It is reported from Teheran that two officers of the Royal Air Force have flown to Kazvin from Baghdad, a distance of 380 miles, in 4 hr. 10 min. The machine was a de Havilland.

The town of Samawa, as distinct from the British camp at that place, is undergoing a heavy bombardment from the air.

Ex-Airmen in the Regular Army.

Under an Army Council instruction, which was issued recently, ex-airmen who re-enlist in the Regular Army will be allowed to count their former service with the Royal Air Force as "service" and as "qualifying service" towards pensions under Articles 1,135 (c) and 1,136 (c) respectively, of the pay warrant.

If five years or more have elapsed between the date of discharge from the Royal Air Force and the date of re-enlistment into the Regular Army, will not count for pension under Army Order 325 of 1919, but will so reckon towards pension under the pay warrant.

An Italian Award.

It is announced that H.M. the King of Italy has conferred the Italian War Cross upon Captain Wedgwood Benn, D.S.O., D.F.C., M.P., for services rendered during the war in connection with the Italian Flying Corps.

A Proposed Reunion Dinner.

It is proposed to hold a reunion dinner for "other ranks" who served in "B" Flight, Artillery Co-operation Squadron, R.F.C. and R.A.F., which, from July, 1916, to Nov., 1919, was stationed at Lydd Aerodrome, Kent. Any past members who would like to attend should communicate with Mr. Leslie Smith, at 27, Kynaston Road, Stoke Newington, London, N.16.

73rd Wing, R.A.F.

It is proposed to hold in London some time in October a reunion dinner of all officers who served under Yarmouth Command. Will all those interested communicate as soon as possible with either Mr. G. F. H. Bloom, 17, Welbeck Street, Mayfair, W.1, or Mr. Leonard Bridgman, care of THE AEROPLANE, 175, Piccadilly, W.1?

AUSTRALIA.

The Air Force.

Mr. Pearce, Minister for Defence, in outlining a new defence policy for Australia in the Senate, Sept. 16th, said that the Air Force would not be a separate corps. There will be both citizen and permanent force units, and the permanent force will probably be required for service with the fleet.

INDIA.

The Punjab Disturbances.

On Sept. 16th a full statement showing the action taken against officials whose conduct was impugned by the Hunter Committee was laid on the table of the Council by Sir William Vincent, member of the Viceroy's Council. In the course of the statement it was stated that owing to the absence of precedent for the use of the Royal Air Force under such circumstances the military authorities proposed to take no action in the case of General Beynon [*sic*], Flt. Lt. Carbery, and Flying Officer Dodkins.

GERMANY.

Surrendered Aircraft.

It was announced in Berlin on Sept. 17th that the delivery of aircraft to the Allies in accordance with the terms of the Treaty of Versailles has been completed.

ITALY.

The Italian correspondent of THE AEROPLANE writes :—

The Death of Tenente Comirato.

The death of Lt.-Av. Fred. Comirato, one of the early Veneto pilots, a pioneer in aviation and a fervent patriot, on the eve of becoming a father, is announced by his family as having occurred in hospital owing to illness contracted on service. The writer owes much to his friendship and the columns of this paper to his kind help in old pre-war times. His decorations include the Croix de Guerre.—T. S. H.

POLAND.

OFFICIAL COMMUNIQUES.

Sept. 14th.—Yesterday we occupied Kovel. . . . The captures include three serviceable aeroplanes . . .

UNITED STATES OF AMERICA.

The Alaska Flying Expedition.

The Alaska Flying Expedition, organised by the U.S. Army Air Service, and consisting of four D.H.4 "Bluebirds" (420 h.p. Liberty) under the command of Capt. St. Clair Street, left Mitchel Field, Mineola, L. I., at 12.33, July 15th, *en route* for Nome, Alaska. The approximate distance from Mineola to Nome is 4,345 miles, and as the expedition is to cover the route both ways, the total flying distance will be in the neighbourhood of 9,000 miles.

The route intended to be followed was *via* Erie (Pa.), Grand Rapids (Mich.), Winona (Mich.), Fargo (N.D.), Portal (N.D.), Saskatoon, Edmonton, Jaspar, Prince George, Hazelton, Wrangell (Alaska), White Horse (Yukon), Dawson, Fairbanks, Ruby and Nome.

On reaching Nome the expedition was to make a 100 mile flight to Cape Prince of Wales, at which point it would be approximately 50 miles from the continent of Asia.

The purposes of the expedition are (i) to establish an aerial route to the N.W. corner of the American continent, so that, should military considerations require it, it would be possible to move Air Service units to Asia by direct flight; (ii) to co-operate with the Engineering Corps and the Geological Survey for the purpose of photographing inaccessible areas in Alaska which have so far not been mapped.

The flight undoubtably opens up an entirely new country and with the reports furnished by this expedition should supply interesting material for an eventual connection between the continents of America, Asia and Europe.

The four D.H.4Bs, piloted by Capt. St. C. Street, 1st Lieut. C. C. Nutt, 2nd Lieut. C. H. Crumrine, and 2nd Lieut. R. C. Kirkpatrick, respectively arrived at Nome at 17.30, Aug. 24th, with a total flying time for the journey from Mineola of 55 hours.

It was intended that the return flight should have been made during the course of the following week.

DUTCH ENTERPRISE.

The following advertisement which appears in the Dutch newspapers should be of interest to British air transport firms :—

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AN ACKNOWLEDGMENT.

In the article on the "History of the Development of Aircraft Wireless," which appears in this week's "Aeronautical Engineering," the two photographs showing the complete wireless telephone receiving and transmitting instruments, and the direction finding outfit as used on Handley Page aeroplanes, are published by courtesy of the *Wireless World*. By an oversight this acknowledgment was omitted from its appropriate position.

A MOTOR CYCLE ACCIDENT.

Henry Newtown Armond, an aircraft rigger of South Farnborough, was killed in a motor cycle collision at Yarmouth on Sept. 13th. He collided with Mr. William Poole, who was also riding a motor cycle. Mr. William Poole, who was slightly hurt, is a director of the Poole Aviation Company.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

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THE WEEKLY COMMENTARY.

The fourth and last instalment of the series of articles on the History of the Development of Aircraft Wireless appears below and deals with the recent development of telephony and of direction-finding equipments.

Descriptions of two of the amphibians designed for the Air Ministry's Competition for seaplanes appear in this issue. The Saunders "Kittiwake"—which has at the time of writing not reached Martlesham—is an extremely interesting effort to break away from conventional design and construction methods.

A brief account of the American machines entered for the forthcoming Gordon Bennett Race appears on page 558. The cantilever-wing Dayton Wright monoplane with variable camber gear is a novelty amongst racing machines.

THE HISTORY OF THE DEVELOPMENT OF AIRCRAFT WIRELESS

IV.—The Conclusion of the War and Subsequent Progress.

In the previous article of this series the first standard telephony receiving set was considered in some detail. In conjunction with this instrument a telephony transmitter was produced, both being specially designed for use in single or two-seater machines. Fig. 1 shows the main instruments of the complete equipment (transmitting and receiving), whilst Fig. 2 gives the internal connections of the transmitter, which did not weigh more than 45 lb.

A TELEPHONE TRANSMITTER.

The transmitter contains two valves, usually referred to as the "power" valve and the "control" valve. The function of the control valve, across which is connected a low frequency choke-coil, is to vary the high-tension voltage supply to the power valve, which acts as an ordinary continuous wave oscillator. The filaments of both valves are lit from a common 6 volt battery, which also supplies a small current of about 0.5 amps. to the microphone circuit.

On speaking into the mouthpiece the air vibrations set up by the voice impinge upon the outer disc of the microphone, thus causing variations in the electrical resistance of the carbon granules within. These resistance variations permit of corresponding changes in current value flowing through the microphone circuit, which thus act upon the grid of the control valve M through the transformer G, shown in Fig. 2.

The primary of this transformer is of very low resistance in order that the full current for which the microphone is designed may be procured without the use of extra batteries. For this reason it is always important that the current should be switched off when the machine is on the ground. Otherwise, when the machine is in repose (i.e. with the engine shut off, and not vibrating) the carbon granules begin to settle down and "pack."

The effect of this packing is to so lower the resistance of the carbon granules as to permit the passage of big currents capable of damaging the microphone seriously. This danger does not exist during flight because, owing to the vibrations of the engine, the granules are constantly agitated, thus keeping their resistance at an appropriate value.

Referring to Fig. 2, the current variations just noted in the grid circuit of the control valve produce correspondingly large variations in potential across the low frequency choke F by the ordinary action of the valve, and thus control the high tension supply to the power valve.

The high tension is provided by an air-driven self-regulating D.C. generator, the regulation being effected by a demagnetising coil and a 6 volt battery. (This is the same battery as is used in the filament and microphone circuits.) With this telephone transmitter a B.T.H. generator is usually employed. It is fitted on the undercarriage of the machine in

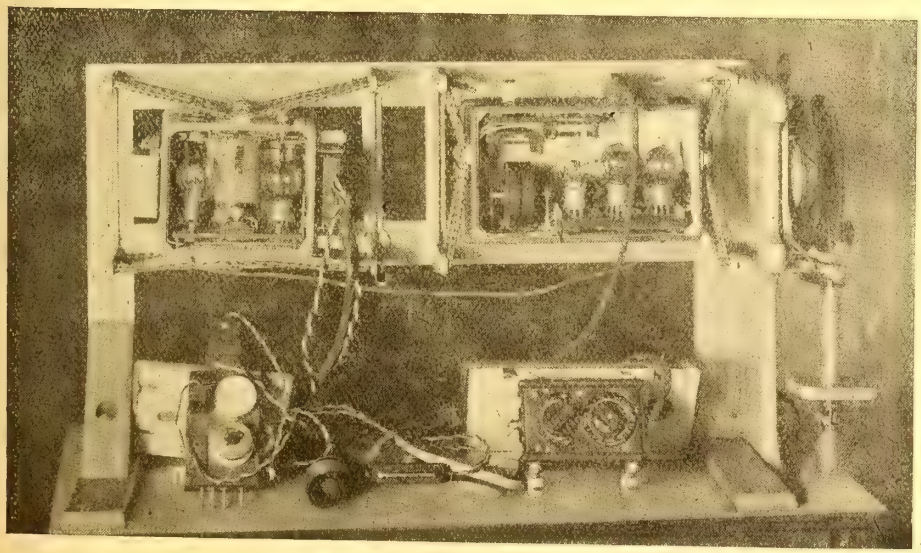


Fig. 1.—A view of the complete instrumental outfit for aircraft wireless telephony, both receiving and transmitting. At the top are to be seen the two sets of valves, on the left the two used for transmitting, and on the right the set of three, which rectify and amplify incoming waves for reception. Note the rubber suspension for both sets. On the right-hand side of the frame the aerial reel is visible.

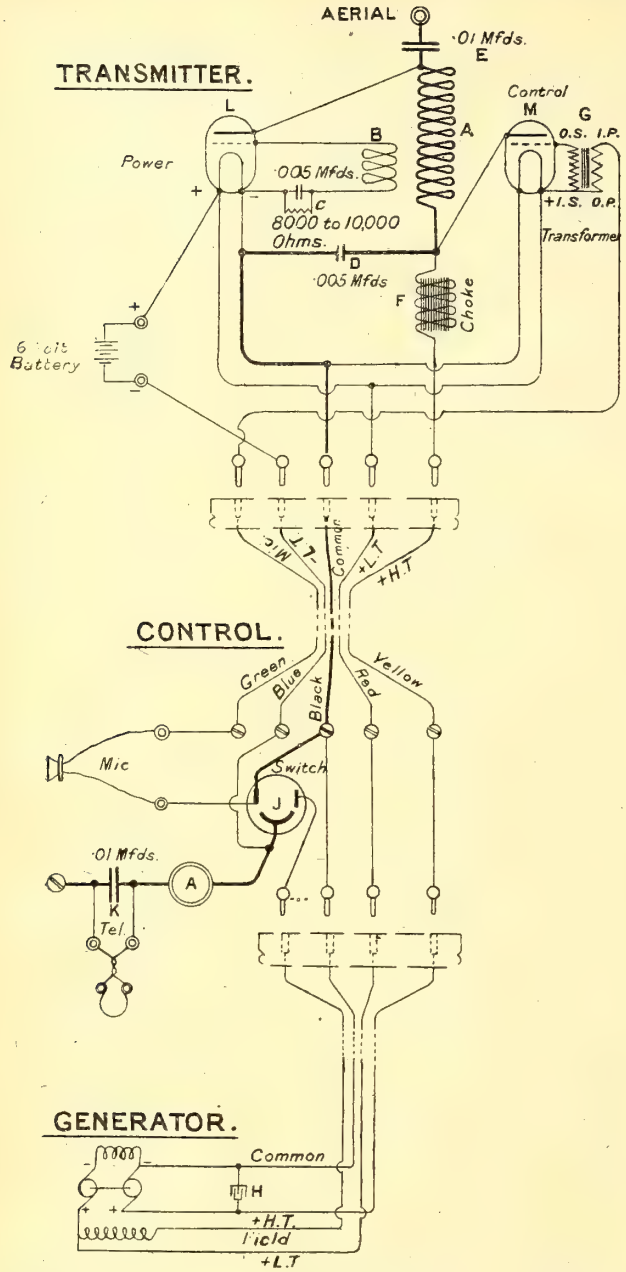


Fig. 2. Internal Connections for Aircraft Telephone Transmitter.

the slipstream of the airscrew, as shown in Fig. 3, and is so designed that when supplying its normal pressure of 600 volts (approx.), at its normal speed of about 4,000 r.p.m., the regulating battery is just "floating"; that is, it is neither charging nor discharging.

Thus, when the transmitter is in operation under such conditions, the regulating battery will—whilst being in a "floating" condition with respect to the generator—be discharging at a rate of about 1.5 amps. through the filaments of the valves. Any variations below or above this normal speed of the generator will result in (1) the battery discharging into the dynamo, (2) the effective discharge of the battery being reduced.

From this it will be obvious that during a fast dive the battery might be actually charging, whilst supplying the necessary current to the valves at the same time. This condition should be avoided as far as possible as it is advisable to have the battery constantly discharging during a flight, in order to keep the filaments at a steady and constant brilliancy. It was found that a variation in filament brightness produced a slight alteration in wave length.

In the power valve circuit, one end of the aerial inductance is connected to the sheath or plate of the valve, and also, through a condenser of 0.01 mfds., to the aerial, as shown in Fig. 2. This condenser insulates the aerial from the high tension direct current.

The other end of the aerial inductance is connected to the plate of the control valve, to the filament of the power valve through a condenser of 0.005 mfds., and directly to one end of the choke coil—the other being connected to the positive pole of the generator. This latter condenser provides an oscillation path between the aerial inductance and the filament of the power valve; it also effectively insulates the high tension circuit from the low potential filament circuit.

The Transmitting Control.

A particular feature of this telephony installation is the transmitting control. This part of the apparatus must be fitted within easy reach of the operator. The four leads from the generator terminate in a female plug, which connects with corresponding points on one side of the control; from another side, five leads are conveyed from the internal connections of the control to the transmitter.

On the outside of the control is mounted a rather complex switch which, on continuous rotation in a clockwise direction, alternately "makes" and "breaks" (1) the filament current, (2) the microphone current, (3) the generator field. In order to facilitate and standardise the fitting of machines, a wiring colour scheme is employed, which is also shown in Fig. 2.

At the time of the Armistice this complete telephony equipment was being successfully and regularly used in a number of squadrons at home and abroad. Since the Armistice, however, wireless telephony in commercial machines was practically a dead letter until quite recently—a few months ago.

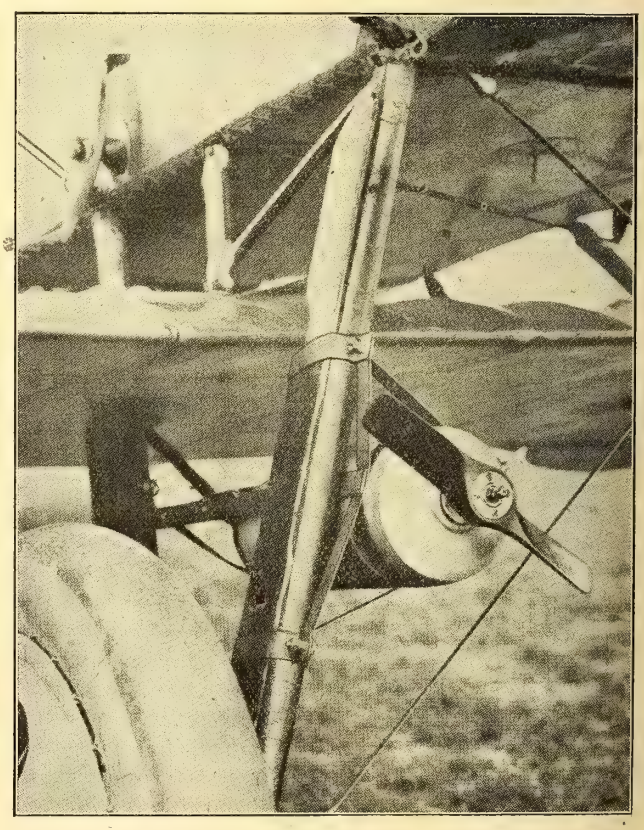
The Marconi Telephony Set.

To-day, an aircraft telephony set designed by the Marconi Company is being used with increasing regularity by machines of the Airco, Instone and Handley Page Companies flying on regular routes between here and the Continent. The Marconi Co. have also progressed considerably with the problem of "telegraph-telephony," whereby a land telephone circuit can be linked up to operate a wireless telephony station at a distant aerodrome. It was by this method that an official in London recently conversed with a machine in flight, *via* Croydon Wireless Station.

Direction Finding Systems.

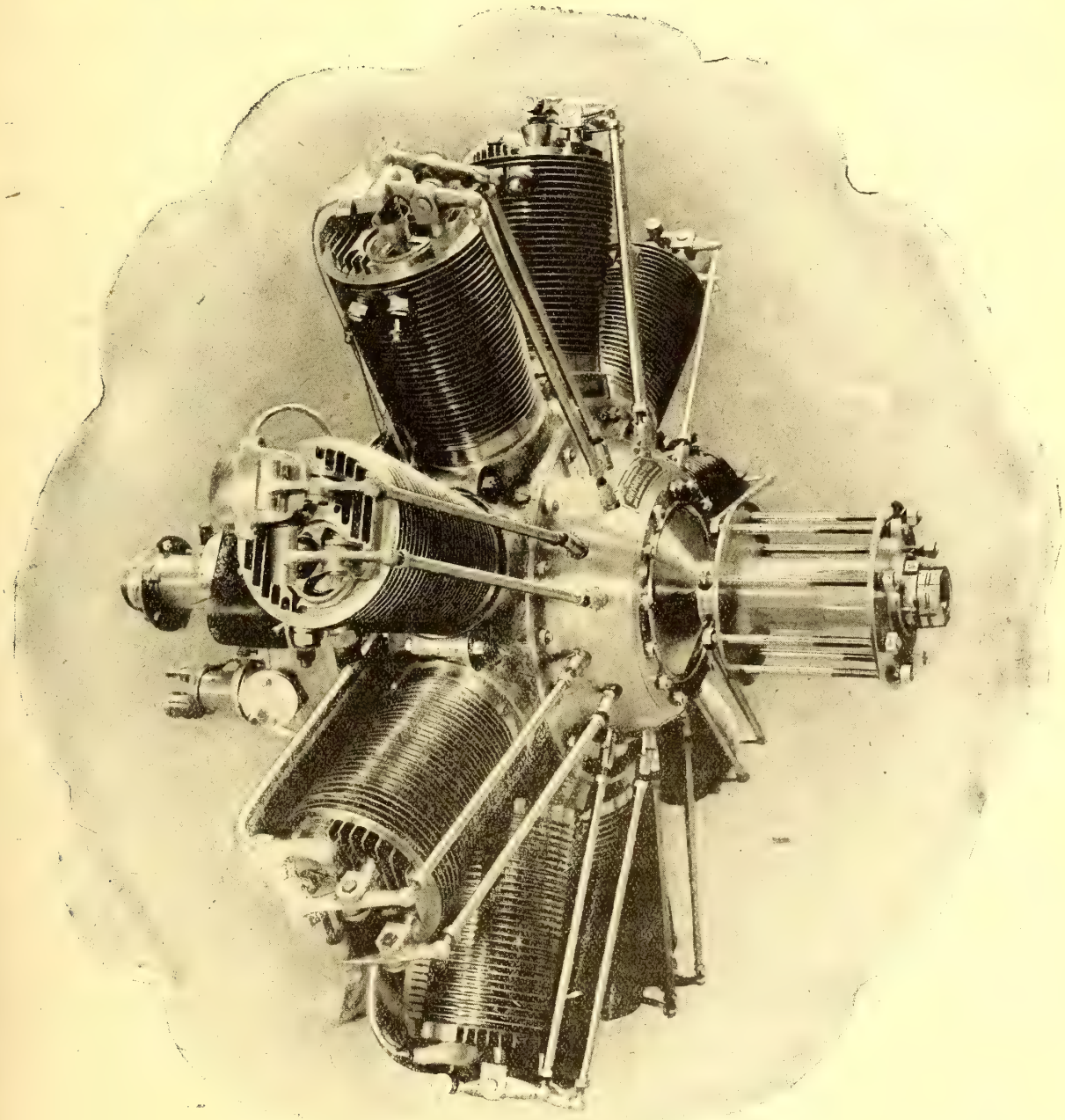
Coming now to the question of wireless direction finding, it must first be stated that there are two distinct systems at present in use; they are known respectively as the "minimum" and "maximum" methods. Of these, the former had been developed before the war and was extensively used by ourselves, our allies and our enemies from the very commencement of hostilities. The latter was evolved by Capt. Robinson, R.A.F., towards the close of 1917.

The principle of directional wireless is based upon the fact that if an aerial, in the form of a symmetrical loop of wire, be rotated about its vertical axis in the path of a wireless



A B.T.H. Air-driven Generator for Wireless Telephony fitted to the undercarriage of a Bristol Fighter.

GWYNNE'S AERO ENGINES



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wave, it will pick up a quantity of energy depending upon the angle it bears to the approaching wave. This energy will be a maximum when the plane of the aerial is *parallel* to the direction of the wave, and a minimum (theoretically, zero) when the plane of its loop is at *right angles* to this direction.

From this it will be seen that the direction of a wireless wave (and, hence, of a transmitting station) may be detected by finding (a) the "maximum point" position, or (b) the "minimum point" position of such a loop aerial. In either case, however, the *line* of direction of the transmitting station is all that can be determined. Thus, for instance, there is no means of determining whether the received signals are coming from N.E. *or* S.W., from N. *or* S., from E. *or* W., etc.

If two receiving stations, some distance apart, take a bearing on the same transmitting station, the actual position of that station can be ascertained; it will lie at the point of intersection of the two lines of direction. Again, by employing a third direction finding station the possibility of error will be eliminated, or, at any rate, reduced, by providing a means of corroborating the other bearings.

We have assumed above that this method of position finding could be carried out by finding the "minimum point" or "maximum point" position of the receiving loop aerial. In practice, however, this is not so. It is exceedingly difficult —in fact, impossible— to locate the exact "maximum point" of such an aerial. It is so "insensitive" around that position that the human ear fails to detect any decrease in the strength of signals between 10 deg. or 15 deg. on either side of the *exact* "maximum point."

Around the "minimum point," however, great sensitivity is obtained; so much so that differences in signal strength can be detected by swinging the aerial coil ever so slightly. In fact, by this system bearings can be taken to an accuracy of 1 deg. This, then, is the principle of the system employed (with certain modifications) by practically all combatants of the war to locate the position of hostile craft—airships, aeroplanes, submarines, seaplanes, men-of-war, land stations, trench stations, etc., etc.

It may well be imagined how dangerous a thing it was to "open one's mouth" in the wireless world during the war under such conditions. Herein lay the primary disadvantage of this system. If an aeroplane wanted to find its position, for example, it had to transmit to the ground direction finding stations—incidentally betraying its position to any enemy direction finding stations that happened to be listening for it.

The intelligent reader may now inquire: "Why shouldn't this difficulty be overcome by reversing the *modus operandi* of the system?" In other words, why not put the receiving aerial in the machine and do the transmitting from the ground? The chief reason lies in the extreme sensitivity of the "minimum point" position; *this is completely negatived in a machine by the noise of the engine.*

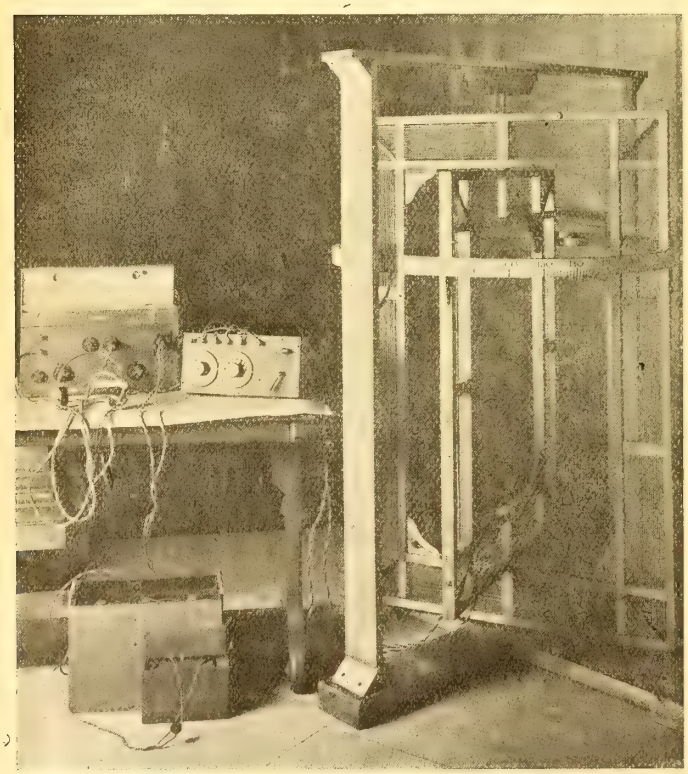

Fig. 4.—Complete Direction Finder Installation as used on Handley Page Aeroplanes.

The Maximum Method.

Towards the end of 1917, Capt. Robinson, R.A.F., developed a system of direction finding which successfully overcame both these difficulties. That is, it enabled a machine to find its own position in the air when working on maximum strength of signals. This method (which is known as the "maximum" method) employs two vertical coils fixed rigidly at right angles to each other; thus when one coil is at the "minimum point" position the other will be at the *exact* "maximum point" position.

On this apparatus, in conjunction with a 7 valve amplifier, signals have been received in a Handley Page machine from a distance of 2,000 miles. The coils can be fitted either on a separate frame inside the fuselage or they can be wound around the wings of the machine. Fig. 4 shows the complete equipment of coils used in the fuselage of a Handley Page.

For the purpose of navigating by the "maximum" method it is, of course, necessary that certain ground stations be used for transmitting to machines at definite intervals. Further, it involves the use of special charts on which the exact position of these stations shall be marked. Also there are a few important corrections to be applied to the original observed bearing in each case.

When working on "fuselage coils" a serious difficulty is introduced by an effect known as "quadrantal error." This is due to the presence of various metal parts in the machine itself (i.e. the engine, bracing wires, controls, etc.), which deflect the path of the wireless wave on its passage to the coils in the fuselage, thus recording a false bearing. This problem is dealt with by swinging the machine on the ground and plotting a quadrantal error curve on a known station for all angles between 0 deg. and 360 deg.

By means of "wing coils" (i.e. with the aerials wound in the wings) a machine is enabled to fly in a straight line to a transmitting station. This method of guiding the direction of a machine will eventually prove of great value in short distance commercial flights, chiefly because of the simplicity of its operation, which dispenses with the necessity of carrying a special navigator.

The pilot's helmet will be fitted with telephone ear-pieces, and by means of a single switch he will be able to tell (from the strengths of the signals he hears) when his machine is pointing directly to the transmitting station. If this station is situated at the aerodrome to which he is flying, he will thus be brought to his destination by the shortest possible route.

Up to the present, commercial aviation companies have had little opportunity of investigating the possibilities of this new method of aerial navigation. Their time and energy have been fully occupied with the problem of carrying on, of struggling to keep afloat on the industrial tide—a concerted battle for existence. To-day, however, by the united influence of British perseverance and skill, we have arrived at a stage in the development of our commercial flying when the promise of the near future demands that serious attention be given to this important question.

It is quite wrong to imagine that this branch of wireless has not yet emerged from the experimental stage. More than two and a half years ago the author carried out successful directional flights to wireless stations 50 miles distant from the aerodrome of departure. Again, wireless telephony has its own important advantages to offer to the development of commercial aviation.

To conclude, the time has arrived when it behoves all enterprising commercial firms to avail themselves of the results of those years of strenuous effort which we have retraced in this brief and necessarily incomplete review of the development of aircraft wireless.

TO BRITISH AIRCRAFT MANUFACTURERS.

Too late to print in extenso in this issue, The Aeroplane has received from the Air Board of Canada a notification that they are inviting tenders for the construction of a number of different types of aeroplanes, seaplanes, and flying-boats. In the first place, orders will be for experimental machines alone to determine the types best suited to Canadian conditions, but successful designs will probably be ordered in quantity.

Aircraft manufacturers who have not received copies of this inquiry and specification can inspect them at the Offices of this paper.

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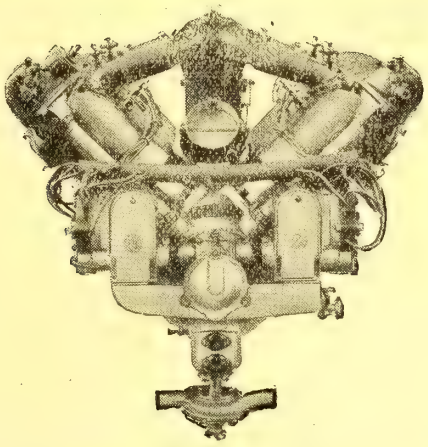

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AMPHIBIANS FOR THE AIR MINISTRY COMPETITION.

THE SAUNDERS "KITTIWAKE."

Though it may justly be contended that the Air Ministry Comfort and Security Competitions for Aeroplanes has produced nothing of startling novelty, the amphibian contest now in process is to some considerably less extent open to this charge.

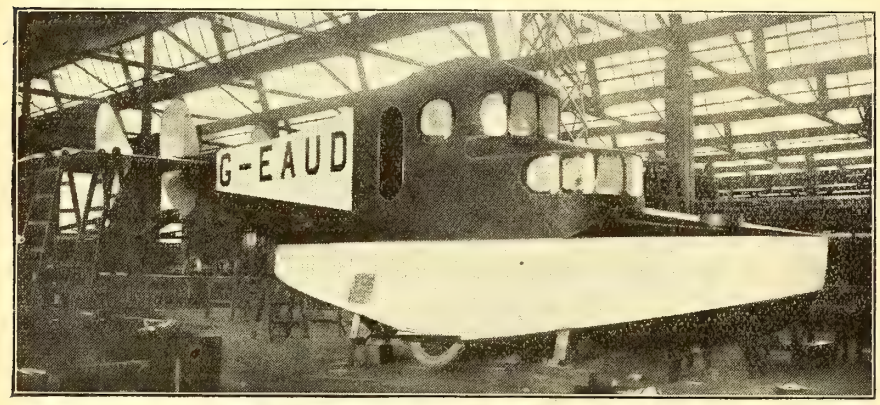
The very fact of the machines being amphibian to some extent secures this, for amphibians have never been usual, but the particular competition has led to the construction of the Saunders "Kittiwake"—a machine bristling with novelties.

Whether this machine actually appears in the trials, or whether the difficulties insuperable from the construction of a machine embodying so many new features prevent her completion in time therefor, is at the moment uncertain, though according to the letter of the rules the "Kittiwake" is already disqualified by her failure to reach Martlesham by Sept. 1st.

Both the hull and the body are boat-built structures, entirely covered with the well-known Saunders Consuta—as, indeed, is the whole of the machine. The hull itself is a boat-form two-step hydroplane, with a Vee bottom and "tumble home" sides. The two steps are close together, and the after step is approximately beneath the C.G. of the whole machine. Between these two steps there are, one at each side, two upwardly extending box structures, wherein are housed the landing wheels and shock absorbers. These two wheel compartments are fitted at the bottom with folding flap doors, cam operated by the wheel retracting mechanism, so that withdrawing the wheels closes the doors.

As the forward step should largely clear the water from the flaps at speed on the water, it seems probable that no serious water resistance will be produced by this wheel arrangement.

The body which surmounts the hull is a two-storey affair,



The Hull and Fuselage of the Saunders "Kittiwake." The lower of the two windowed compartments is that for pilot and mechanic. Above is the passenger cabin. One of the landing wheels is visible, protruding through the hull bottom between the two steps.

Nevertheless it redounds greatly to the courage and enterprise of the firm of S. E. Saunders and Co. that the machine should have been put in hand at all.

As appears to be usual with amphibians, the "Kittiwake" is essentially a flying boat with retractable wheels. In this case the wheels retract to within the hull when on the water or in the air.

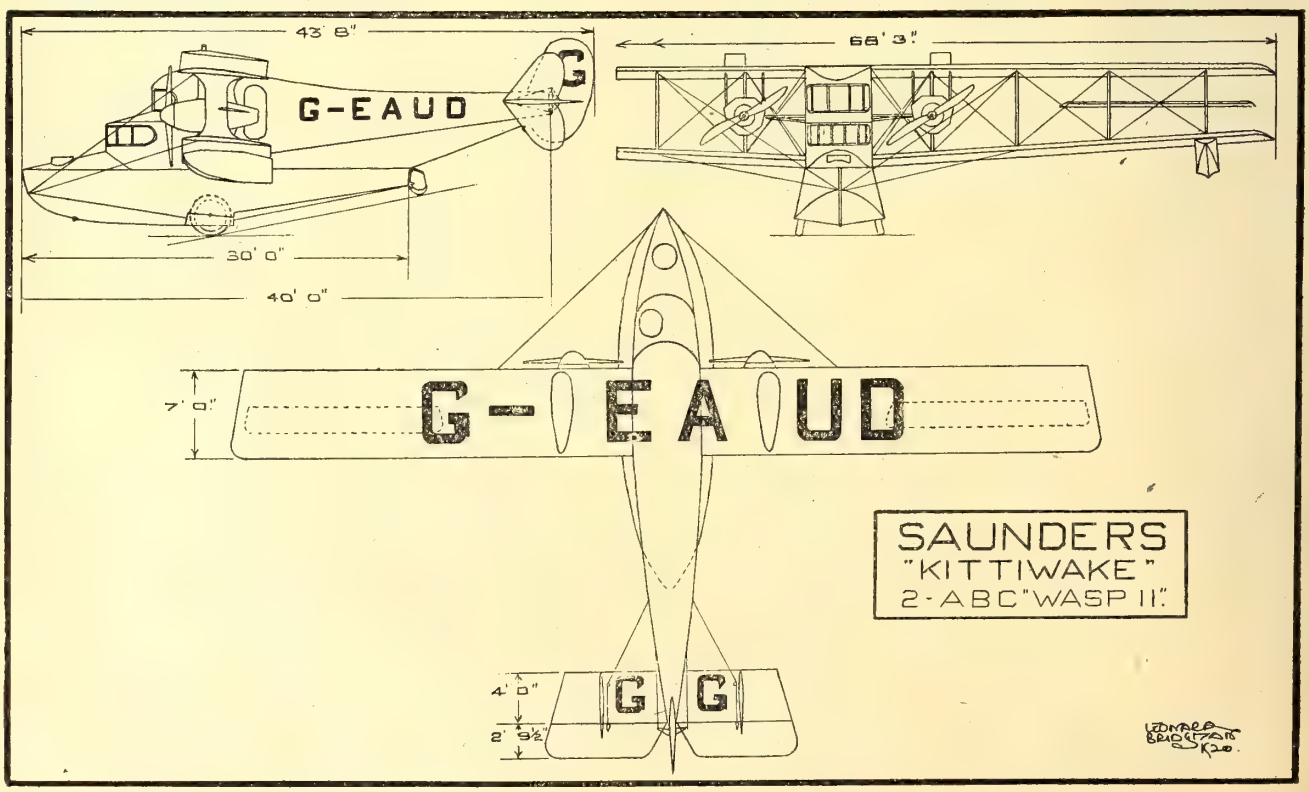
The hull proper is relatively short, but it is surmounted by a fuselage which contains the control mechanism, passenger and goods space, and extends aft to support the tail surfaces.

The hull and the surmounting body are separate structures, removable one from the other by the release of a number of steel fishplate joints, so that a damaged hull may be replaced by a spare if necessary.

whose form is obvious from the drawings and photographs of the machine.

The lower storey, projecting forwards, houses the pilot, with alongside him space for a mechanic, and this compartment is open to the hull space beneath. The mechanic thus has access to the little bow cockpit, whence mooring and tying-up operations are carried on, and aft to inspect the landing gear. He has also access to the upper or passenger storey, and can proceed right down the body if necessary to inspect control leads and the like.

This upper storey, fitted with ample Triplex glazed windows, forward, is fitted with longitudinal upholstered seats at each side, giving very ample room for certainly five passengers. Entrance is by large side entrance doors, one on each side, and aft the doors there is a small lavatory compartment.



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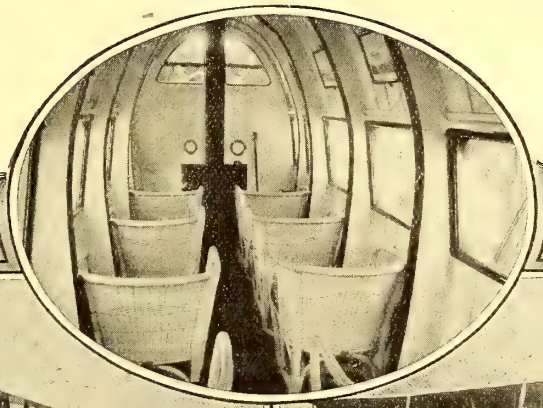

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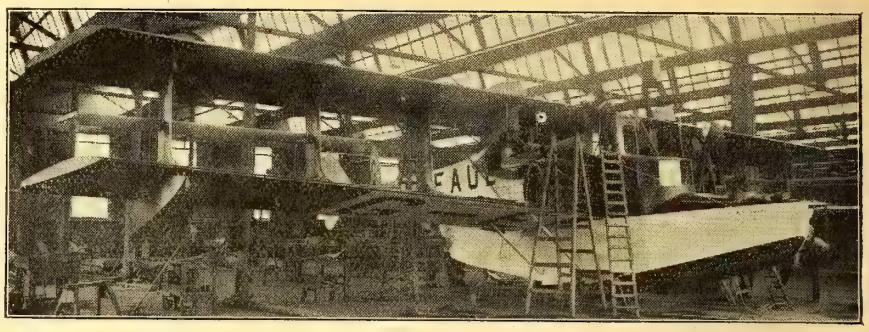


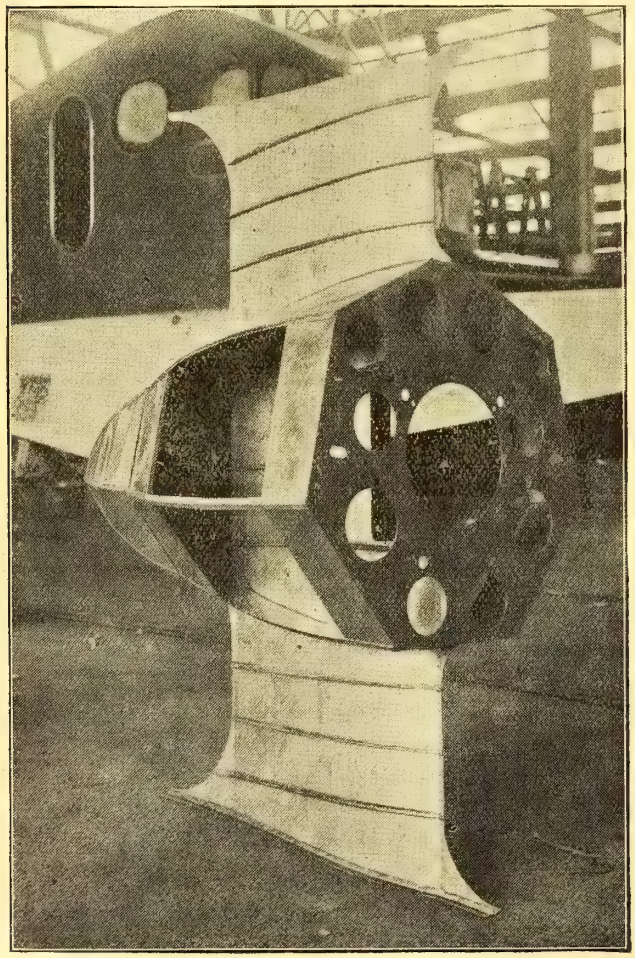
The Saunders "Kittiwake" in an advanced stage of erection at the makers' works. The interplane ailerons and the single I struts between wings can be seen clearly.

The cabin compartment entirely fills the gap between the wings, which are attached directly to the body.

These wings are extremely interesting and embody a number of novel features. They are built up on two spars, which are of normal box construction, with spruce flanges and Consuta webs. Between spars are ribs, more or less of the normal girder type. Large box-section compression ribs connect these two spars, and a covering of Consuta plywood completes the structure, acting both as covering and as cross-bracing. Single I form interplane struts, built up with an internal spruce structure, covered and braced by Consuta, connect the upper and lower wings, each attached to one of the above-mentioned compression box ribs.

A single row of interplane bracing is used, midway between the spars, and the fittings whereto this bracing is attached consist of long eyebolts running through the box rib, which is here solid, in the line of the wiring, and bedded down on the outer surface of the wings on bevelled-off packing blocks of duralumin.

To the front and rear spars, over the whole span of the wings, except for a few inches at each wing tip, there are hinged leading and trailing edge ribs of duralumin. These ribs are mounted on stout duralumin torque tubes in such wise that all leading and trailing edge ribs move as one unit. These ribs are covered top and bottom by extensions of the Consuta covering of the main wing section. This covering is free to slide relatively to the ribs, projecting tongues from the ribs passing through slots in the covering and hold the covering to the rib contour. At leading and trailing edges the covering passes under trough section duralumin sheet members, and is there equally free to slide.



One of the Duralumin Engine Housing and Strut Units of the "Kittiwake."

At frequent intervals along these leading and trailing edge portions are levers similar to those commonly applied to ailerons. Through the central portion of each wing there passes a long duralumin tube, running in bearings, and carrying a series of racks. These racks gear into pinions, which are mounted in bearings affixed to the upper wing surface.

The pinions are mounted on hollow, internally screwed axles, fitted with three start threads, right and left handed, and into these are inserted screws, which operate push-and-pull rods, coupled to the levers on the leading and trailing edges. Movement of the racks therefore moves both leading and trailing edges up or down simultaneously.

The push rods operating the racks pass through the cabin walls, and are there controlled by a chain-operated screw gear from alongside the pilot seat.

On the result of wind tunnel tests of a model of the machine, it is expected that this form of variable wing will permit of a very low landing speed and a quick get-off, together with a good high speed.

Lateral control is effected by interplane surfaces after the old Curtiss method, but balanced. The first interplane strut out from the body, instead of being built of timber and Consuta, is a built-up duralumin affair, expanded at the centre into a streamline body of hexagonal end elevation, which forms the engine mounting and cowling.

Two A.B.C. "Wasp" engines of 200 h.p. each are attached to these mountings, which are also stayed to the body by a pair of horizontal steel-tube struts.

Fuel for these engines is carried in gravity tanks of streamline form mounted above the top plane, slightly outwards from the engine struts.

The tail plane, mounted at the extreme end of the upper body, is a monoplane, supported on bearings at the front spar, and carried on a screw adjustment gear aft. A large central balanced rudder is appended on the centre line, with two large fixed fins, one half-way along the semi-span of the tail. These fins are coupled at their upper and lower extremities by tubular struts, and cross-bracing wires to the fin tops and bottoms make this tail unit a rigid structure. Like the remainder of the machine, the whole tail is Consuta covered.

Specification of the Saunders "Kittiwake."

Type	Amphibian Passenger Carrier.
Span	68ft. 3in.
Length	43ft. 8in
Height	14ft. 9in.
Length over hull	30ft.
Chord	7ft.
Gap at centre	7ft.
Gap at wing tip	5ft. 4in.
Total area of main planes	864 sq. ft.
Total area of ailerons	60 sq. ft.
Total area of tail planes	67 sq. ft.
Total area of elevators	45 sq. ft.
Total area of fins	40.5 sq. ft.
Total area of rudder	28 sq. ft.
Weight empty	3840 lbs.
Fuel (100 galls.)	720 lbs.
Oil (8 galls.)	80 lbs.
Crew (2)	360 lbs.
Useful load	1,200 lbs.
Total weight loaded	6,200 lbs.
Engines (2), A.B.C. "Wasp II.," 200-h.p. each.	
Wt. per h.p.	15.5 lbs.
Loading	7.18 lbs., 4 ft.

THE FAIREY AMPHIBIAN.

This, the only float-type seaplane entered for the seaplane competition, is in all essentials of the standard Fairey type 3 class, with a rearrangement of the seating accommodation and the addition of retractable landing-wheels.

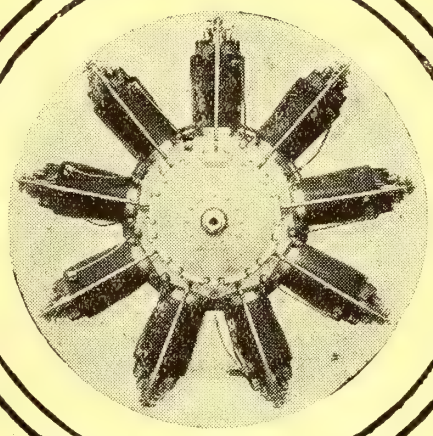
The Fairey patent variable camber gear, consisting of trailing edge flaps over the whole wing span, capable of being raised or lowered at will, is employed, as it is in all recent machines of this firm's design.

The twin floats are of the single-step type, fitted with long extensions aft the C.G., so that the main floats normally

POWER

—an outstanding point in "the most efficient Aero Engine in the world"

ABC

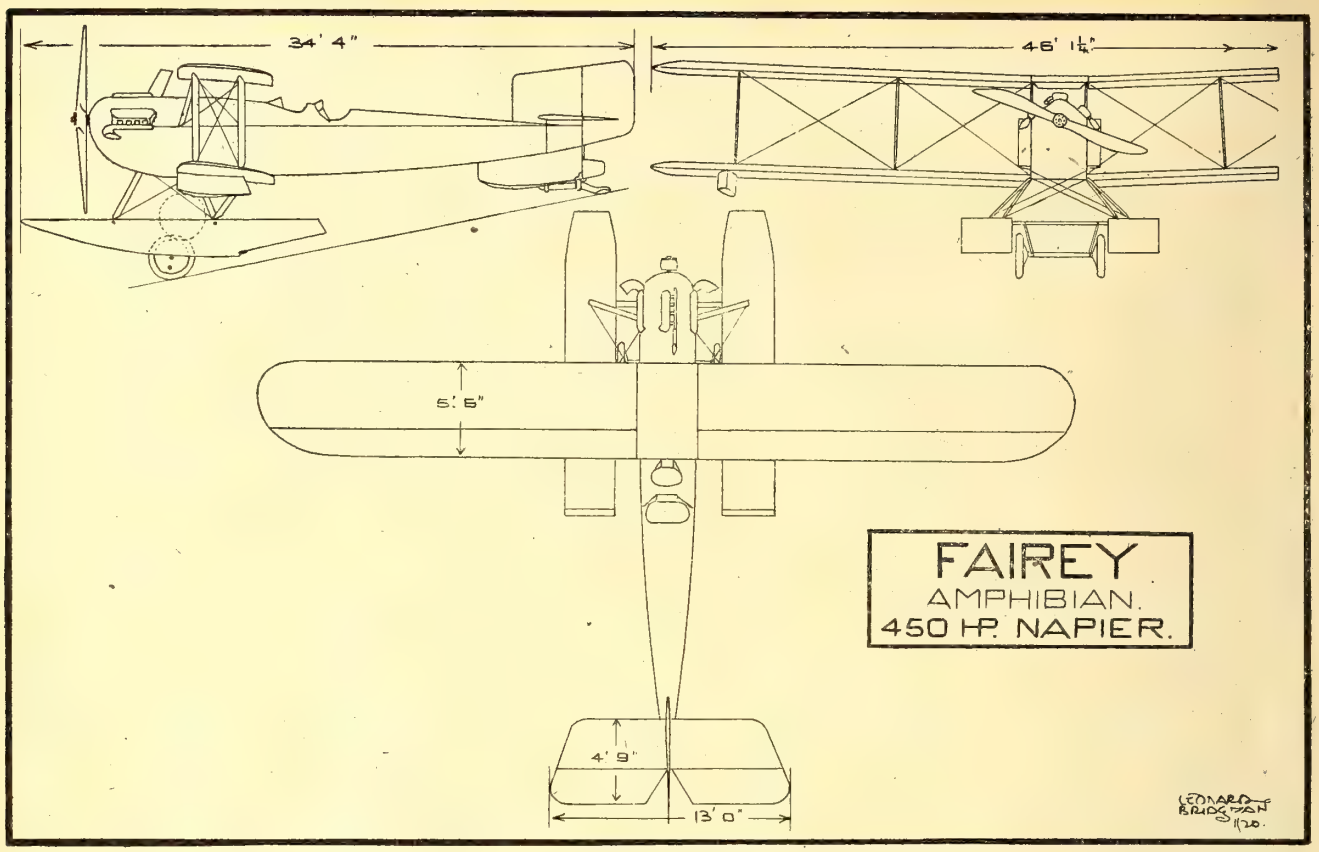


The Engine illustrated is the DRAGONFLY—340 h.p.—9 cyl. (Static Radial).

WALTON MOTORS, Ltd.
Walton-on-Thames.

Telephone:
ESHER 306 and 307.

Telegrams:
"MOTORS, WALTON-ON-THAMES."



support the whole machine. The tail float comes into action only if the wings are folded on the water or if the main floats are punctured. There is a very large reserve of buoyancy on the main floats. These are each subdivided in nine watertight compartments, and the machine will remain afloat with a total of eight compartments punctured.

The retractable wheels are mounted between the floats, and carried on a steel frame, rectangular in plan and triangular in side elevation, hinged at its forward cross-member to the floats and rotatable about this hinge by a wheel in the pilot's cockpit.

The top cross-member of this frame is extended and falls into wells in the floats and is there locked by four undercut hooks which engage in shackles on the frame extension.

These hooks are positively engaged by the movement of the operating wheel and form an absolutely secure lock. A laminated wooden tail skid attached beneath the tail float completes the undercarriage arrangements.

The wings fold, and folding and locking arrangements are operated from the pilot's seat.

The pilot's cockpit is just aft the centre section, and immediately behind it is a second cockpit seating two passengers side by side. Petrol and oil tanks are stowed in the fuselage ahead of the pilot's seat, the petrol stowage being divided between two tanks.

Specification of the Fairey Amphibian.

Type ...	Three-seater Float Amphibian	Total surface of wings,	488 sq. ft.
Span	46 ft. 1¼ in.	Span of tail	13 ft.
Length overall	34 ft. 4 in.	Chord of tail	4 ft. 9in.
Height overall	12 ft.	Petrol capacity	77 gall.
Chord	5 ft. 6 in.	Oil capacity	9 gall.
Gap	5 ft. 7 in.	Engine	Napier, 450 h.p.

No data as to weights or performance available.

THE AMERICAN GORDON BENNETT RACERS.

The forthcoming Gordon Bennett Race, to be held at Etampes at the end of September, will gain considerably in technical interest from the presence of an American team of challengers, consisting of three machines, all of American design.

Europe has—since the war—seen nothing of American aircraft design more recent than the J.N. type Curtiss. It has, however, heard much of it, and the opportunity of comparing performances with claims which the race should afford will be welcomed by many designers from the less vocable parts of the earth.

The American entries are made by the Aero Club of Texas, entering the Curtiss-built "Texas Wild Cat"; the Dayton Wright Company, who have designed and built the "R.B." monoplane for the purpose; and the U.S. Army, which is to be represented by a machine designed by Mr. A. V. Verville, of the McCook Field Experimental Station, and built at that establishment.

The Army Entry.

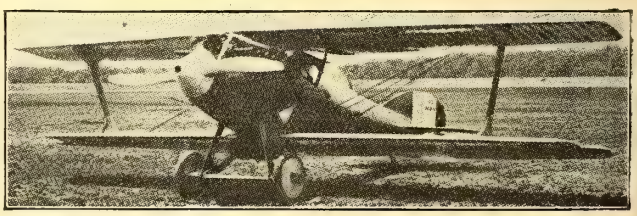
Very little data is available as to this craft. Illustrations in the American journals show it to be a single-bay biplane, with one I-type interplane strut a side, of slightly greater span on the top plane than on the bottom, and fitted with balanced ailerons on the lower wings only. The fuselage is of circular section, and the power plant consists of one of the new Packard 12-cylinder enlarged and improved "Liberty"-type engines which is capable of developing some 600 h.p.

The general effect is somewhat reminiscent of the later types of S.P.A.D.

The Dayton Wright Monoplane.

The Dayton Wright type R.B. monoplane possesses a number of interesting features, none of them entirely novel but constituting as a whole a distinct advance in the direction of intelligent design for racing purposes. If the execution be as intelligent as the general design the machine should be a formidable opponent to the fastest European types.

The machine is a cantilever monoplane with variable camber wings and a retractable undercarriage. An engine of 250 h.p. is fitted, so that it is evident that the designer has relied rather on careful aerodynamic design than on



The Verville Biplane (600-h.p. Packard Engine) designed and built at McCook Field (U.S. Army Air Service) for the Gordon Bennett Race.

WESTLAND

The MK.11 WESTLAND LIMOUSINE

fitted with the 300 h.p. Hispano Suiza engine has now been thoroughly tried out at our Works and proved most satisfactory in every way.

We are in a position to give early delivery of these machines.

The special features are: **Large carrying space in the cabin; outside petrol tanks; Engine Spares easily obtainable in Europe and America**

The machine is well worth the serious consideration of Aerial Transport Companies.

May we send you particulars?

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AIRCRAFT, 141 YEOVIL.

The Dayton Wright R.B. Cantilever Monoplane (280-h.p. Hall-Scott Engine) for the Gordon Bennett Race.

brute force for the attainment of speed. The single wing is mounted high on the fuselage, which is very deep and oval in section. Judging from illustrations, this wing is not of a very deep section, but it has on its lower surface an appreciable bulge, which suggests that at least one wing spar is of considerably greater depth than the general outline of the wing will accommodate. The wing is a timber structure, entirely veneer covered, and the variable camber device employed is the well-known trailing edge flap system due largely to Mr. Fairey. The undercarriage is a modification of the standard vee type, wherein the usual cross-member joining the bases of the vee is replaced by a pair of struts on each side, hinged at the centre of the fuselage. The vee struts, instead of being fixed at their upper extremities, can be drawn up inside the body, the axles then folding upwards till the wheels fold into orifices in the side of the fuselage.

The fuselage is a monocoque structure of veneer bound with glued fabric.

The tail is a cantilever affair, and the undivided elevator is thickened in the centre to carry on and wash-out the lines of the fuselage.

The span is 22 ft. 6 in., the length overall 22 ft., and the power plant consists of a six-cylinder vertical Hall-Scott engine of the "Liberty" type, developing 250 h.p., wherewith the builders' publicity department claim that a speed of 200 m.p.h. will be attained.

The "Texas Wild Cat."

Built by the Curtiss concern to the order of a Mr. Cox, of the Aero Club of Texas, this machine is also a monoplane. It appears to be of the rigid truss type, braced by tubes from undercarriage to the wing spars; but as the only illustration of the machine so far discoverable is mainly occupied by the dense crowd which the christening bottle of "real champagne" naturally attracted in a dry land, the evidence is not conclusive. The body is stated to be of monocoque construction, and the machine is equipped with the Curtiss 12-cylinder Vee-type engine of 400 h.p.

In view of the known technical resources of the Curtiss Company, it seems highly probable that this will prove to be the most successful of the American entries It starts with the initial advantage that no spectacular claims appear to have been made by its producers, whose sole statement as to the machine's performance is that it required the special preparation of a large addition to their own aerodrome for landing.

SOARING FLIGHT.

Among the technical notes which are regularly issued by the American National Advisory Committee for Aeronautics there has recently appeared a translation from the French of an account by M. P. Idrac of the results of certain researches into the soaring flight of birds, carried out in the vicinity of Dakar and in French Guinea. The process adopted was that of making careful measurements and observations of the speed and direction of air currents in the zone of operation of soaring birds. Anemometer kites were used to study wind velocities, and a kite carrying a pivoted vane, whose inclination gave a measure of the vertical wind component, was used to investigate deviations of the wind from the horizontal.

The conclusions arrived at are that the wind in these localities nearly always has a vertical component, and that areas of both ascending and descending currents can be observed. Some of these areas remain fixed, and are traceable to definite local obstructions, and other areas are variable and change in position without apparent laws or assignable causes.

The regions of soaring flight always coincided with areas of ascending air. In these areas the birds fly either circling or on an irregular course. The birds move with moving areas of rising wind, and do not cross from one rising area to another except in approximately straight lines and without stopping. They may thus lose height, to be regained in the next ascending area, and they thus give the impression that they soar at random.

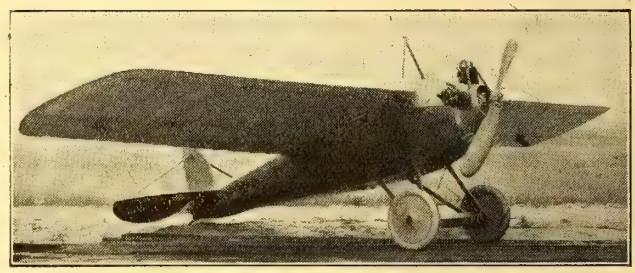
No connection could be established between wind irregularity and soaring. Soaring often occurred in feeble and regular breezes. By determining the speed of soaring birds by trigonometrical observations, the wind speed and, by repeated observation, the minimum upward component in which soaring was observed, the observers were able to determine approximate values of the Lift/Drag ratio of the birds, and the effective value of their Lift coefficients. So far they have only arrived at approximate figures for two types of birds. These are given in the table below.

Bird.	Air Speed ft. sec.	Upward Air Velocity ft sec.	L/D.	Kl.
Egyptian Vulture	24	1.6	15	0.51
African White-backed Vulture	28	1.6	17.5	0.96

These figures are given as first approximations from a limited series of observations, to be confirmed or refuted by further research.

Assuming that they are reasonably close to the facts, they indicate that birds have succeeded in attaining a better combination of a high lift with a low resistance than have the designers of aeroplane wings, but that the superiority of the bird in this respect is by no means so great as is often alleged.

A GERMAN SPORTING SINGLE-SEATER.

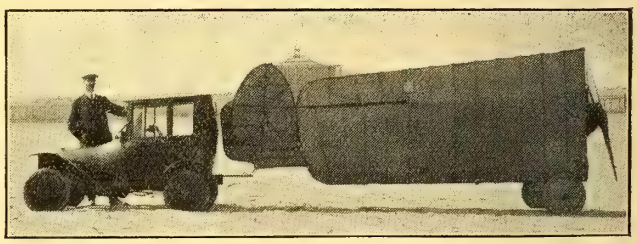


The Sablatnig Sporting Type Monoplane.

The latest Sablatnig production is the sporting monoplane K.E.1, which has now been sanctioned by the Inter-Allied Commission. From the illustrations it will be seen that the model is of the ordinary monoplane type with the landing wires led to a tube cabane and the lower ones carried to the plywood fuselage. Both the main planes and the tail unit can be folded when the ailerons are clipped by plates. The control cables from the levers are led inside the planes aft the front spar. The strut support features of the fin is maintained. The engine is a 3-cylinder Rheinische Aero Werke. The tail skid is a steel spring. The main dimensions of the Sablatnig sporting monoplane K.E.1 are :—

Max. length	5.3 m.	Full load weight	285 kg
Span	8.4. m.	Fuel capacity	2.5 hrs.
Span, folded	1.4 m.	Run to get off	50 m.
Max. height	2.2 m.	Landing run	25 m.
Weight, empty	185 kg.	Speed	100 km.

E. H.



The Sablatnig Single-Seater packed for transport.

ITALIAN NOTES.

The Sarri Triplane.

The Sarri triplane illustrated recently fails to show its feature in most of the photographs taken of it, the absence of the elevator in the tail and its substitution by trailing edge elevator on the bottom plane.

A New Ricci Triplane.

Messrs. Ricci have produced a slightly bigger two-seater triplane with span increased to 4.50 and length to 5 metres. Weight is 360 kg., speed expected about 140 k.p.h., and flight capacity, with a 50-h.p. rotative engine, three hours.

The F.I.A.T. B.R.

It seems scarcely possible that the F.I.A.T. B.R. 700 h.p. has not so far been officially adopted by the Government, but one believes this to be a fact. Several Savoias with the big 480 Ansaldo S. George engines have, however, been ordered.

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(THE ORIGINAL NON-POISONOUS)

Is most Economical and Durable and OFFERS THE GREATEST RESISTANCE TO FLAME

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AND THE

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Telegrams—Tetrafree, Piccy, London.

AIR MINISTRY NOTICES TO GROUND ENGINEERS.

No. 8, 1920.—FITTING OF BALLAST IN AIRCRAFT.

It is hereby notified :—

Attention is drawn to the precautions necessary when fitting ballast in aircraft for trimming purposes

The ballast should take the form of bags filled with earth or sand, or of weights made of sheet lead.

Bags of small shot or stones should not be used, as experience has shown that such bags wear out quickly and allow the filling to escape.

The bags or covers for the lead should be made of stout canvas or other strong material, and should be provided with adequate means of attachment, such as straps or strong cord, by which they can be secured in the cockpit.

In order to preclude all risk of accidents, such as fouling of controls or falling out of the aircraft, the ballast should always be securely attached in the cockpits.

No. 9, 1920.—DEFECTS IN AIRCRAFT TIMBER.

It is hereby notified :—

Attention is drawn to a common defect found in aircraft timber, especially spruce, which is usually known as "spiral" and sometimes erroneously as "cross grain." The existence of such a defect is due to the twisting of the tree during growth, and consequently cannot be determined by a casual examination of the straightness of the grain. It can, however, be detected by closely examining the direction and inclination of the wood fibres. It is usually most apparent on the "flower" side of the grain, and takes the form of small resin channels of a brownish colour, running at an inclination to the axis of the strut or spar, as the case may be

A slight inclination is of no disadvantage, but when the slope is great the timber is liable to break off short. An indication of the amount of slope which, from experience, has been found to be satisfactory is, roughly, when the inclination of the fibres is not more than 1 in 15.

The defect is more readily found by means of splitting the timber, the angle of the split giving the true slope of the fibres, and when making new timber parts for replacement it is recommended that the part be made slightly longer to allow for a short piece to be cut off for splitting purposes.

When making such tests the split should be made in two directions :—

(1) In line with the grain, and
(2) At right-angles to it.

Air Ministry, Sept. 11th, 1920.

WANTED: BACK NUMBERS.

Mr. F. V. Wagner, Librarian of the Manufacturers' Aircraft Association, Inc., of 501, Fifth Avenue, New York, is anxious to obtain for the Association's Library certain back numbers of the now extinct periodical called *Flying*, which was published by *Land and Water* in London. The particular numbers required are as follows :—

Vol. 3. Nos. 55, 59, 62, and numbers for month of Jan., 1918. Vol. 4. No. 97.

Any readers of THE AEROPLANE who have these numbers in stock and are prepared to sell them are requested to communicate with Mr. Wagner.

A GERMAN CAMERA GUN FOR AERIAL SPORTS.

The Danish correspondent of THE AEROPLANE writes :—

The well-known German Messter cinema film corporation has brought out a camera gun which is to be exploited by the Optikon Co., Ltd., formed in Berlin and Holland, and should appeal to erstwhile scout fighters, who have found civil aerial transport outside their scope of activities or interest, as it tends to turn the spectacular show of the manœuvrability of pilots and single-seater mounts to account The camera will co-operate automatically with the machine-gun, as fighting will take place exactly as on active service, and the film, in junction with a watch time-recorder, will register when the opponent was hit, as is evident from the illustrated specimen.

The company intends to arrange sporting fights of this nature in replacement of the pre-war exhibitions, and will conduct them in combination with totalisator, as signal rockets can start and stop the fighting and the timing tell the result when the films have been developed a few minutes after the landing.

TRADE NOTES.

A Paying Proposition.

There are many big business firms who say that they are only waiting to see an air line make a commercial success before they themselves embark on a similar enterprise. It is therefore worthy of note to record the fact the our pioneer air line, Aircraft Transport and Travel, Ltd., is now running at a profit.

The line is now in the hands of Mr. Frank Searle, who was responsible for the change over from horse-drawn to motor-propelled vehicles of the London General Omnibus Company. Mr. Searle did not profess to know much about the technical side of aircraft, but with the competent litlte group of pilots with which, fortunately, the line was staffed this was a minor consideration. The fact remains that Mr. Searle introduced so much of his business experience into the working of the line that in a very short time it was showing a profit. One confidently expects that very soon the line will be showing a very big profit.—G. D.

Machine Tools.

At the Machine Tool and Engineering Exhibition now holding the stage at Olympia a most interesting exhibit is that of Messrs. Lehman, Archer and Co., Ltd., makers of the famous "Original London-made" engineers' taps and dies, etc.

They are also showing die-nuts, chasers, tap wrenches, etc. All taps and dies shown are made by the firm at their works at Fairlop, near Ilford

Messrs. Lehman, Archer and Co. were directly concerned in the establishment of the B.A. standard thread, and the first B.A. tap was made in their factory.—G. D.

A New Yellow Metal.

An alloy, which it is claimed possesses all the virtues of phosphor bronze, gunmetal and Admiralty bronze, with the added advantages of an extremely high ductility and great resistance to corrosion, is known as P.R. Corona Metal. It is to be seen at the machinery exhibition at Olympia, and it is further claimed that it yields clean close-grained castings and can be melted repeatedly without change in its properties. The makers are P.R. Metals, Ltd., 6, 7 and 8, Old Bond Street, W.1.

A Change of Address.

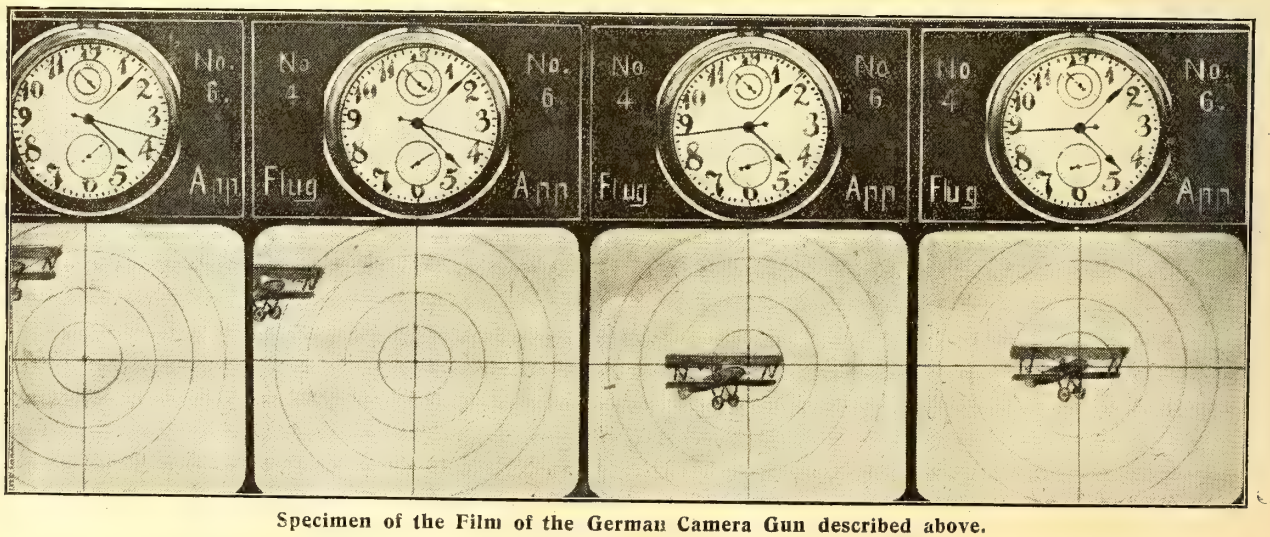
The Aerolite Piston Co., Ltd., give notice that, on and after Monday, Sept. 6th, their address will be 36, North Audley Street, Oxford Street, W.1.

New Companies.

ADASTRAL AIR LINES, LTD.—Private company. Regd. Sept. 10th. Capital, £3,000 in 2,850 ordinary shares of £1 each and 3,000 deferred shares of 1s. each. To carry on the business of aviators, carriers and transporters of passengers and cargo by flying machines, airships, balloons, etc., and to adopt an agreement with C. Oliver. The first directors are :—C. H. Oliver, Whitmore Lodge, Sunninghill, Berks.; J. E. F. Harley, 19, Stratford Place, W.1; G. W. R. Pidsley, Ravensleigh, Water Lane, S.W.2; F. W. de Valla, 19, Stratford Place, W.1. Secretary : W. Chant. Solicitor : A. E. Timbrell, 16, Regent Street, S.W.1. Registered Office : 16, Regent Street, S.W.1.

NATURE FOLLOWS ART.

It is interesting to note that owing to a sketch which appeared in a recent issue of THE AEROPLANE, the spelling of the name on a punt not a thousand miles from Bourne End has now been revised.



Specimen of the Film of the German Camera Gun described above.

Beardmore

THE PIONEERS OF RELIABLE AIR TRANSIT

They have increased their reputation year by year until to-day it stands first for RELIABILITY among Pilots and Mechanics.

Commercial Transport will be on a sound financial basis quicker by utilising the ECONOMY and SIMPLICITY of BEARDMORE ENGINES.

Many leading manufacturers of Aircraft are doing so by installing the 160 h.p. Beardmore as the most reliable and economical engine available.

Complete engines and all duplicate parts dispatched at 24 hours' notice.

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Works - - Parkhead Steel Works, Glasgow.

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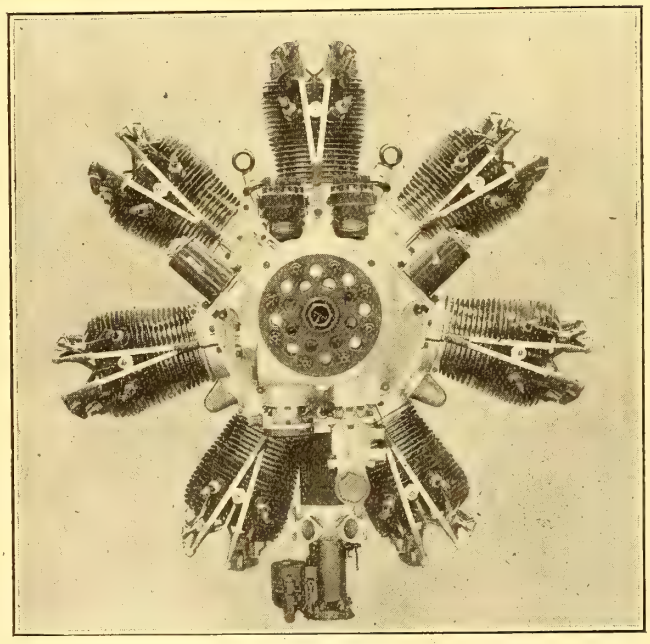
FIRTH'S "MESMERIC" CARBON CASE-HARDENING STEEL.

Equivalent to Air Ministry Specification S 14.

This is a thoroughly reliable case-hardening steel, easy and simple to work, certain and satisfactory in its results. It is celebrated for its tough fibrous core and extremely hard and durable case.

Firth's handbook on Aeroplane steels gives full specifications of this and other standardised qualities, including analyses and mechanical properties.

THOS. FIRTH & SONS, LTD. SHEFFIELD.



The Armstrong Siddeley 150 h.p. Radial Engine.

ARMSTRONG SIDDELEY Aircraft Engines

Latest Models:

45 h.p. 2 cyl. Armstrong Siddeley Aircooled.
150 h.p. 7 cyl Armstrong Siddeley Radial.
300 h.p. 14 cyl. Armstrong Siddeley Radial.

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THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

NOTICE TO AIRMEN (No. 97 of the year 1920).

AIR MINISTRY, Sept. 15th.

AERODROME LIST AMENDMENTS.

It is hereby notified:—Additions and Amendments to Notice to Airmen, No 81 (Consolidated List of Aerodromes), of July 20th, are as follows:—

LIST B.—(b) Stations temporarily retained for service purposes. The following should be deleted:—

Aerodrome.—Shoreham; Lat. 50 deg. 50 min. 20 sec. N.; Long. 0 deg. 17 min. 30 sec. W. *Height above sea-level,* 10 ft. *Nearest railway station,* Shoreham (L.B. & S.C.R.), 1 mile. *Nearest town* (by road), Brighton, 6½ miles. *True bearing from Aerodrome,* E.

Thetford, Lat. 52 deg. 23 min. 30 sec. N.; Long. 0 deg. 47 min. 30 sec. E.; 100 ft.; Thetford (G.E.R.), 2 miles; Thetford (by road), 2 miles; N.W.

LIST C.—Licensed Civil Aerodromes.—(b) Civil Aerodromes licensed as "Suitable for Avro 504 K and similar types of aircraft only."—Except in very few instances accommodation does not exist. The licences have also been issued for limited periods only. Foreshore Aerodromes are not included. The following should be added:—

Aerodrome.—Brighouse, Thornhills Lane; Lat. 53 deg. 42 min. 30 sec. N.; Long. 1 deg. 45 min. 30 sec. W. *Height above sea-level,* 400 ft. *Nearest railway station,* Clifton Road (L. & Y.R.), 1 mile. *Nearest town* (by road), Brighouse, 1¼ miles. *True bearing from Aerodrome,* S.W.

Sheringham; Lat. 52 deg. 56 min. 0 sec. N.; Long. 1 deg. 13 min. 0 sec. E.; 80 ft.; Sheringham (M. & G.N.), ½ mile; Sheringham (by road), ½ mile; N.N.W.

AIR CONFERENCE, 1920.

The Air Ministry announces:—

Owing to the rapidly increasing importance of aviation, the variety and complexity of the problems facing those interested in its development, and the desirability of an examination of the present situation and a mutual exchange of opinions on the subject, the Air Council has decided to call together an Air Conference. Its more immediate object will be to bring representative members of *all sections of the community* into contact with the practical work being done to-day with a view to assisting future progress.

In view of the nature of this conference the Lord Mayor has kindly granted the Air Ministry permission to hold it in the Council Chamber of the Guildhall, London, and has also consented to open the proceedings on the first day. It will take place on Oct 12th, 13th, and 14th, 1920, attendance being by invitation.

The following have kindly consented to take the chair on the three days, respectively:—

First day: The Lord Montagu of Beaulieu.
Second day: The Lord Weir of Eastwood.
Third day: Admiral of the Fleet, Earl Beatty.

First Day.—The subject for consideration on the first day will be civil aviation. One paper will be read by Major-General Sir Frederick Sykes, G.B.E., K.C.B., C.M.G., Controller-General of Civil Aviation, on the present situation of Civil Air Services, British and foreign: the organisation necessary for success and the prospects for the future. A second will be read by Mr. H. White-Smith, C.B.E., chairman of the Society of British Aircraft Constructors, dealing with the demands of Civil Aerial Services from the constructional point of view.

Second Day.—The second day will be devoted to technical questions affecting both the Civil and the Service sides of the art. Papers will be read by Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., Director-General of Supply and Research, Air Ministry, on the development of aircraft; and by a representative of the Royal Aeronautical Society.

Third Day.—On the third day the broader aspects of Service aviation will be dealt with at the morning session by Air Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., Chief of the Air Staff; while the subject of airships, with special reference to their construction and commercial operation, will be taken up in the afternoon by Commander Sir Trevor Dawson, R.N.

After each paper has been read the subject dealt with will be open to discussion by those present. These discussions, it is hoped, will be of value in disseminating a fuller knowledge of the advantages and possibilities of transport by air and will lead to the more general employment of aircraft in the future.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

(Compiled by the Staff of THE AEROPLANE.)

SEPTEMBER 13th:

A.T.&T., DH16, G-EAPT, London-Paris, 09.45-11.55, G.&M., Nil, Robbins
A.T.&T., DH16, G-EASW, London-Amsterdam, 10.35-13.33, G., Nil, Forson
A.P.B., Westland, G-EAJL, London-Paris, 12.17-14.40, Nil, 2, Courtney.
M.A., Breguet, F-CMAI, London-Paris, 12.32-15.00, Nil, Nil, Le Sec.
A.T&T., DH16, G-EAPM, London-Paris, 16.45-18.45, G.&M., Nil, Tebbitt
A.T.&T., DH9, G-EAQA, London-Paris, 17.03-19.15, G., Nil, Carter.
A.T.&T., DH9, G-EAQP, Amsterdam-London, 08.40-11.20, Nil, 1, Milnes.
A.T.&T., DH9, G-EAPL, Paris-London, 09.50-11.55, Nil, 2, Reeves.
A.T.&T., DH9, G-EAQA, Paris-London, 10.00-12.20, Nil, 2, Carter.
C.desG.E.A., Goliath, F-GEAB, Paris-London, 11.35-14.45, G., 1, Favreau & 1.
C.T., Nieuport, F-CGTA, Paris-London, 12.26-15.10, M., Nil, Mauler.
A.T.&T., DH16, G-EAPT, Paris-London, 15.00-17.28, Nil, 2, Robbins.
A.T.&T., DH16, G-EASW, Amsterdam-London, 15.04-17.38, M., Nil, Holmes.
A.T.&T., DH18, G-EARO, Paris-London, 16.00-18.25, G., 6, Armstrong.

SEPTEMBER 14th:

I.A.L., DH4, G-EAMU, London-Lyons, 11.15-17.45/15th, Nil, 2, Barnard.
A.T.&T., DH9, GEPL, London-Amsterdam, 11.30-15.54, G., Nil, Milnes.
A.T.&T., DH18, G-EAUF, London-Paris, 11.40-14.20, G.&M., 6, Armstrong
A.T.&T., DH16, G-EASW, London-Paris, 11.40-14.20, Nil, 4, Reeves.
C.T., Nieuport, F-CGTA, London-Paris, 12.55-15.55, Nil, Nil, Mauler.
A.T.&T., DH16, G-EALM, London-Paris, 16.45-18.55, M., 4, Robbins.
A.T.&T., DH16, G-EAPM, Paris-London, 11.02-13.25, Nil, 4, Tebbitt.
A.T.&T., DH9, G-EAQA, Paris-London, 11.15-13.46, Nil, 2, Carter.
A.T.&T., DH9, G-EAGY, Amsterdam-London, 11.49-14.15, Nil, 2, Bradley.
A.T.&T., DH9, G-EAQL, Amsterdam-London, 15.11-17.50, G.&M., Nil, Forson.
A.T.&T., DH18, G-EAUF, Paris-London, 16.00-18.40, Nil, 5, Armstrong.

SEPTEMBER 15th:

A.T.&T., DH16, G-EAPM, London-Paris, 10.05-12.55, Nil, 3, Holmes.
A.T.&T., DH9, G-EAQA, London-Paris, 10.10-12.55, G.&M., 1, Forson.
A.T.&T., DH9, G-EAGY, London-Amsterdam, 11.35-14.15, G., Nil, Carter
C.desG.E.A., Goliath, F-GEAB, London-Paris, 12.29-16.00, G., 1, Favreau & 1.
A.T.&T., DH16, G-EASW, Paris-London, 10.15-12.46, Nil, 4, Reeves.
C.desG.E.A., Goliath, F-GEAD, Paris-London, 12.50-16.05, G., 6, Labouchere & 1.
A.T.&T., DH9, G-EAPL, Amsterdam-London, 15.15-13.10/15th, M., 1, Milnes.
A.T.&T., DH16, G-EALM, Paris-London, 15.45-17.53, G., Nil, Forson.

SEPTEMBER 16th

A.T.&T., DH18, G-EAUF, London-Paris, 14.05-16.45, G.&M., 6, Forson.
A.T.&T., DH16, G-EALM, London-Amsterdam, 14.06-16.40, G., Nil, Lines.
A.P.B., Westland, G-EAJL, Paris-London, 08.35-13.00, Nil, 1, Courtney.
A.T.&T., DH9, G-EAQA, Paris-London, 10.00-14.19, Nil, 2, Holmes.
A.T.&T., DH16, G-EAPT, London-Paris, 16.30-18.40, Nil, 3, Tebbitt.
A.T.&T., DH., G-EAQL, London-Paris, 16.32-18.45, G.&M., 1, Bamber.
A.T.&T., DH9, G-EAGY, Amsterdam-London, 15.34-18.40, G.&M., Nil, Carter.

SEPTEMBER 17th:

A.T.&T., DH16, G-EASW, London-Paris, 09.40-12.20, M., 4, Reeves.
A.T.&T., DH9, G-EAPL, London-Amsterdam, 10.02-12.29, G., Nil, Holmes.
A.T.&T., DH16, G-EAQS, London-Paris, 10.20-12.25, G., 3, Armstronge.
A.P.B., Westland, G-EAJL, London-Paris, 10.35-13.20, G., Nil, Courtney.
C.desG.E.A., Goliath, F-GEAD, London-Paris, 12.34-15.40, G., 4, Labouchere.
A.T.&T., DH9, G-EAGY, London-Paris, 15.50-18.30, G., 1, Milnes.
A.T.&T., DH9, G-EAQA, London-Paris, 15.55-18.35, M., 2, Carter.
A.T.&T., DH18, G-EAUF, Paris-London, 11.30-13.55, Nil, 7, Forson.
C.T., Nieuport, F-CGTU, Paris-London, 12.25-15.10, M., Nil, Petit.
A.P.B., Westland, G-EAJL, Paris-London, 15.10-17.30, Nil, 2, Courtney.
I.A.L., DH4, G-EAMU, Paris-London, 16.10-18.11, G., 1, Barnard.
A.T.&T., DH16, G-EASW, Paris-London, 15.54-18.10, G., Nil, Robbins.
A.T.&T., DH16, G-EAPT, Paris-London, 16.25-18.43, Nil, 4, Tebbitt.

SEPTEMBER 18th:

A.P.B., Westland, G-EAJL, London-Paris, 08.10-11.20, Nil, Nil, Powell.
A.T.&T., DH16, G-EAPT, London-Paris, 09.55-12.50, G.&M., 1, Robbins.
A.T.&T., DH9, G-EAPU, London-Amsterdam, 11.20-13.48, G., Nil, Forson
A.T.&T., DH16, G-EALM, London-Paris, 15.55-18.40, M., 4, Tebbitt.

A.T.&T., DH9, G-EAQA, Paris-London, 09.55-12.35, Nil, 2, Bamber.
A.T.&T., DH18, G-EAUF, London Paris, 10.25-12.45, G., 7, Armstrong
A.P.B., Westland, G-EAJL, Paris-London, 14.30-16.50, Nil, 2, Powell.
A.T.&T., DH9, G-EAPL, Amsterdam-London, 15.10-18.45, G.&M., 1, Holmes.

SEPTEMBER 19th:

A.T.&T., DH18, G-EAUF, London-Paris, 10.25-12.15, G., 7, Armstronge.
A.T.&T., DH16, G-EAPT, Paris-London, 10.30-12.55, Nil, 2, Reeves.
A.T.&T., DH9, G-EAGY, Paris-London, 10.20-13.10, Nil, 2, Milnes.
CdesG.E.A., Goliath, F-GEAB, London-Paris, 15.15—, G., Nil, Patin.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

(Compiled from Air Ministry Communiques. Log of Cricklewood Aerodrome received too late for inclusion.)

SEPTEMBER 13th:

H.P.T., HP, G-EATN, London-Paris, 12.09-15.35, G., 6.
H.P.T., DH4, G-EAVL, Amsterdam-London, 08.50-11.25, Nil, Nil.
H.P.T., HP, G-EASY, Paris-London, 12.35-15.58, G., 7.
H.P.T., HP, G-EASL, London-Brussels, 15.17-18.30, G.&M., 7.
S.N.E.T.A., DH9, O-BATO, Brussels-London, 14.40-18.55, Nil, Nil.

SEPTEMBER 14th:

H.P.T., HP, G-EATG, Paris-London, 12.22-17.05, Nil, 6.
H.P.T., HP, G-EATN, Paris-London, 12.23-16.12, Nil, 6.
H.P.T., HP, G-EALX, Paris-London, 12.25-16.25, Nil, 7.
H.P.T., HP, G-EATK, London-Paris, 12.16-15.30, G., 7.
H.P.T., HP, G-EASM, London-Paris, 12.30-15.55, Nil, 5.
M.A., Breguet, F-CMAI, Paris-London, 13.00-landed St. Inglevert, G.&M., Nil.
H.P.T., DH4, G-EAVL, Amsterdam-London, —14.40, Nil, Nil.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 15.05-18.25, G.&M., 2.
H.P.T., HP, G-EASI, Brussels-London, 15.05-19.05, G., 1.

SEPTEMBER 15th:

H.P.T., DH9, G-EAUN, Amsterdam-London, 09.07-12.25, Nil, 1.
H.P.T., HP, G-EALX, London-Paris, 12.20-15.55, G., 7.
H.P.T., HP, G-EATK, Paris-London, 12.30-15.55, Nil, 9.
H.P.T., HP, G-EASM, Paris-London, 12.45-landed Beauvais, G., 4.
H.P.T., DH9, G-EATA, London-Brussels, 14.50-17.12, G.&M., 2.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 15.00-18.30, Nil, 2.
H.P.T., DH4, G-EAVL, London-Amsterdam, 16.25—, M., Nil.

SEPTEMBER 16th:

H.P.T., HP, G-EALX, Paris-London, 12.20-15.53, Nil, 5.
H.P.T., HP, G-EATM, London-Paris, 12.47-16.30, G., 10.
M.A., Breguet, F-FYMS, Paris-London, 13.40—, Nil, Nil.
H.P.T., DH9, G-EATA, Brussels-London, 14.25-18.25, G., Nil.
S.N.E.T.A., DH4, O-BARI, London-Brussels, 15.22-17.20, G.&M., 1.
H.P.T., DH4, G-EAVL, Amsterdam-London, 14.30—, Nil, Nil.
H.P.T., DH4, G-EAVL, London-Amsterdam, 16.31—, G.&M., Nil.

SEPTEMBER 17th:

H.P.T., HP, G-EAVL, Amsterdam-London, 09.05-12.23, G.&M., Nil.
H.P.T., HP, G-EATH, London-Paris, 09.48-14.35, Nil, Nil.
M.A., Spad, F-CMAW, Paris-London, 10.27-12.50, G., Nil.
H.P.T., HP, G-EATM, Paris-London, 12.10-15.58, Nil, 8.
H.P.T., HP, G-EASY, London-Paris, 13.35-19.10, Nil, 9.
H.P.T., DH9, G-EAUN, London-Brussels, 15.04-17.15, M., Nil.
H.P.T., HP, G-EATH, Paris-London, 15.50-19.15, G., Nil.
S.N.E.T.A., DH4, O-BATO, Brussels-London, 15.30-19.20, Mail, Nil.

SEPTEMBER 18th:

H.P., DH4, H-9243, London-Amsterdam, 16.24—, Nil, 1.
H.P.T., DH9, G-EATA, London-Amsterdam, 16.25—, Nil, 2.
H.P.T, HP, G-EAVL, London-Amsterdam, 16.25—, Nil, 2.
H.P.T., HP, G-EAVL, Amsterdam-London, 09.46-13.15, M., 1.
H.P.T., DH9, G-EATA, Amsterdam,London, 09 52-landed Lympne 13.09, Nil, Nil.
H.P.T., HP, G-EASY, Paris-London, 12.40-16.15, Nil, 7.
H.P.T, HP, G-EATJ, London-Paris, 12.25-19.30, Nil, 7.
H.P.T., HP, G-EATM, London-Paris, 12.35-17.20, G., 7.
M.A., Breguet, F-CMAB, Paris-London, 13.30-landed Lympne 19/9/20, G.&M., Nil.
H.P.T., DH9, G-EAUN, Brussels-London, 14.35-14.40, G.&M., 1.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 16.10-12.05 (19/9/20), H. Nil
H.P.T., HP, G-EAVL, London-Amsterdam, 16.30-19.00, G, 3.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 15.45-landed St. Inglevert, Nil, Nil.

SEPTEMBER 19th:

S.N.E.T.A., DH4, O-BALO, St Inglevert-London, 11.50-12.57, Nil, Nil.
H.P.T., HP, G-EASN, London-Paris, 12.38-16 10, Nil, 4.
H.P.T., HP, G-EATJ, Paris-London, 12.15-15 50, Nil, 4.
H.P.T., DH9, G-EAUN, Brussels-London, 12.05—, Nil, Nil.
S.N.E.T.A., DH9, O-BALO, London-Brussels, 15.10-17.25, Nil, Nil.

Air Port Statistics.

MACHINES :—

Croydon	65
Cricklewood	50
Total	115

PASSENGERS AND CREWS :—

Passengers, Croydon	130
Cricklewood	155
Total	285
Crews, Croydon	70
Cricklewood	72
Total	142
Total passengers and crews	427

Inland Flying at Croydon.

Sept. 13th.—A.T. & T. : D.H.18, 1 test; D.H.16 started Paris and returned.
Sept. 14th.—A.T. & T. : D.H 9, 1 test.
Sept. 15th.—Nil.
Sept. 16th.—A.T. & T. : D.H.9, 2 joy-rides; D.H.16, 1 test.
Sept. 17th.—A.T. & T. : D.H.9, 1 joy-ride. Beardmore : G-EARY from Renfrew (Ward). I.A.L. : Vimy, joy-riding and photography.

Inland Flying at Cricklewood.

Sept. 13th.—Capt. Hearne, Avro, to Birmingham; Handley Page test.
Sept. 14th.—Handley Page test.
Sept. 15th.—2 Handley Page tests.
Sept. 16th.—D.H.4 from Lympne.
Sept. 17th.—2 D.H.9 tests.
Sept. 18th.—Handley Page test.
Sept. 19th.—Nil.

London-Paris Air Mails.

The Postmaster-General announces that from the 16th inst. the afternoon air mail to Paris will leave Croydon at 15.30 instead of 16.30

The latest times for posting letters will be as follows :—

(a) For letters handed in at certain post offices :—General Post Office, 14.00; Threadneedle Street Branch Office, 13.45; Lombard Street Branch Office, 13.45; Parliament Street Branch Office, 13.30; Charing Cross Branch Office, 13.50; W.C.D.O., 14.10; W.D.O., 13.45; S.W.D.O., 13.45. (For registered letters the mail will close five minutes earlier in each case.)

(b) For letters posted in public letter-boxes, 11.30 at the South-Eastern District Office, 11.00 at other district offices and at the larger branch offices in the E.C. district, and 08.30 in all sub-districts.

In the provinces there will be no change, except at a few places in the south-east of England. In any case of doubt inquiry should be made of the local postmaster.

The London Terminal Aerodrome

The Air Post of Banks, Ltd., have been busy during the week, Mr. Courtney and Mr. Powell both making return journeys. The other pilots attached to this line are Messrs. Lawford, McMullin and Campbell Orde.

The fare is £10 10s. single, which entitles the holder to a homeward flight at £8 8s. Considerable patronage seems assured for this enterprising line.

A Beardmore W.B.2 G-EARY, which was exhibited at Olympia, arrived on Sunday from Renfrew piloted by Mr. Ward. One believes that this is the first machine of the Beardmore Air Line, which has been promised for some time.

On Wednesday the Farman "Goliath" was used as a combined "Palais de Danse" and photographic studio. One learns from the daily Press that on that day the clouds were 3,000 ft. below the surface of the aerodrome. This must be so because the Press said that dancing took place 3,000 ft. above the clouds, but the terpsichorean evolutions or rather, one should say, poses took place on the ground before the machine left for Paris.—G. D.

A.T. and T. Notes.

The feature of the week was Mr. Lines' flight on a D.H.16 to Amsterdam in 1 hr. 55 min. This was accurately timed and is authentic. A special machine to Eastbourne and back was booked on the 17th.

It is interesting to note that A.T. and T. pilots in common with those of other air lines who have headquarters at Croydon frequently receive "tips" from their passengers. Being ex-officers they naturally cannot accept these, which therefore go into a fund to benefit the mechanics.—G. D.

The Instone Air Line.

Mr. Barnard, on the D.H.4, flew to Aix-les-Bains on Tuesday and returned on Friday. The passenger was a Roumanian diplomat who booked the machine for the trip.

On Sunday, Capt. Alfred Instone and Mrs. Instone were taken for an extended trip on the D.H.4. Both expressed themselves delighted and completely converted to civil aviation. The same afternoon Mr. Barnard was up on the "Vimy" taking photographs and passengers. He finished with one of those spiral glides which are equally delightful to watch or experience.—G. D.

London-Amsterdam Air Mail Service.

The following alterations have been made in the London-Amsterdam service time table :—From Sept 23rd, 1920, machines will leave Cricklewood Aerodrome at 14.30 instead of 16.00.

From Sept. 16th, 1920, machines will leave Amsterdam for London at 08.50, calling at Rotterdam at 09.10 for passengers, mails and freight.

From Sept. 27th, 1920, machines will leave Amsterdam for London at 07 50, calling at Rotterdam at 08.10 for passengers, mails and freight. Dutch time is given in each case from Amsterdam.

The Air Port of Cricklewood.

An example to the British public in general was set by a lady of three score and twelve years who travelled from London to Paris in a Handley Page. She knitted and grazed all the way across and made the very natural remark at the finish that she did not see what there was "to make a fuss about" in flying.

Cowes.

The Saunders "Kittiwake" amphibian made a flight on Sept. 19th over the Solent. The machine alighted in a bay for some minor adjustments, and the pilot, being unfamiliar with the locality, ran upon some rocks. The "Kittiwake" was taken back to Cowes. The damage is slight and it is hoped she will be repaired in a few days.

Kingston.

Mr. T. O. M. Sopwith, C.B.E., has instructed Messrs. George Trollope and Sons, of 25, Mount Street, Grosvenor Square, W., to sell privately or by auction the Horsley Towers (Surrey) estate, which Mr. Sopwith purchased from the Earl of Lovelace a short time ago. Mr. Sopwith has only recently completed an expenditure of several thousands of pounds upon the mansion, which is now considered one of the finest in the county. Practically the whole of the village of East Horsley and several small residences are included in the estate, which comprises 2,000 acres.—J. F. S.

Woking.

Various rumours have been floating around concerning the future of Martinsyde, Ltd., doubtless owing to the closing down of other aircraft and motor works. With regard to Martinsydes it has been said that (1) a large proportion of the employees were being discharged, (2) the works were to be closed down, (3) Martinsyde, Ltd , would amalgamate with Vickers, Ltd., (4) Mr. Handasyde was severing his connection with the firm.

On inquiry one discovered, as was expected, that not one of these rumours had any foundation. One was informed that most of the aircraft workers and "non-productive" men were being discharged, but against that many hands were being engaged for work on the Martinsyde-Newman motor-cycle and sidecar. The firm have decided that they cannot afford to spend much money on aircraft work at present, owing to lack of Government support and dearth of orders for aircraft, except from the Colonies and South America, where many Martinsyde machines have been sent. A small number of aircraft workers will be retained, and the firm are not intending to abandon the design and construction of aeroplanes.

There is no likelihood at present of the works closing down; this remote contingency would only be brought nearer by serious industrial disorder, such as the threatened miners' strike. While the output of motor-bicycles from the works is much below expectations, the position of the firm may well bear comparison with many of the larger companies in the trade. Apparently defective castings have caused much trouble. It is interesting to note that a foundry is being constructed at the works. The demand for the new product of the firm exceeds the supply for the time being, chiefly owing to the low price.

Although feeling the effects of the slump in the aircraft and motor industries, Martinsyde, Ltd., are in a good position financially, and when the industrial world is in a more peaceable state they hope to have much profitable business. Nothing is further from the minds of the directors than amalgamation with any other firm, and Messrs. Martin and Handasyde are as keen and energetic as ever in furthering the interests of the firm.

The hangars, shops, etc., are being retained at Brooklands, and, as stated before, aircraft work will still be carried on, this side of the business being capable of rapid expansion when necessary.

Many people in the Colonies and South America are giving orders for Martinsyde commercial machines of the F.6 and "A" types, which they find of great value for such purposes as mail carrying, passenger carrying, forest patrolling, surveying from the air, etc. To investigate the possibilities and requirements of civil aviation in Canada is the purpose of Mr. R. H. Nisbet's visit to that country.

Martinsyde, Ltd., have taken a stand at Olympia for the forthcoming motor show, and are showing three models.

One was also informed that the "Semi-quaver" has received little alteration, but has been very thoroughly repaired in preparation for the Gordon Bennett race.—J. F. S.

FOREIGN INTELLIGENCE.

DENMARK.

The Danish correspondent of THE AEROPLANE writes :—

The Anglo-Scandinavian Air Mail Service was inaugurated on Sept. 15th, when Prince Axel, himself a pre-war Maurice Farman pilot, handed the first mail bags to the aeroplane starting for Hamburg, after the mail, arriving by air from Stockholm *via* Malmo, had been reloaded by motor road transport.

Two former flight-serjeants have now trained on the D.H.9 which they shall fly, beside the English pilots.

Letters handed in at the Central Post Office in Copenhagen before 08.45 should be delivered in London during the afternoon of the next day. A postcard posted on Sept. 16th only arrived on Sept. 19th, but has the Sunday as an easy excuse. The sprinkling of stamps shows that the rate is at present prohibitive.—E. H.

FRANCE.

French Civil Aviation Statistics.

Le Service de la Navigation Aerienne has now issued statistics as to civil aviation accidents between Jan. 1st and July 15th, 1920.

During this period more than 1,278,500 kilometres have been flown in 9,624 hours of flight. Passengers to the number of 10,364 have been carried in 13,449 flights.

In the same period there have been the following accidents :

(1) Fatalities to pilot and passengers, 3.
(2) Pilots or passengers injured, 7
(3) Accidents causing neither injuries nor death, 32.
Number killed, 3 pilots and 2 passengers—5.
Number injured, 7.

The Alerion.

On Sept. 14th M. Louis Damblanc continued his experiments with the Alerion helicopter of original design In attempting to make a vertical ascent one of the rotating wings broke and dissembled the entire apparatus.

M. Damblanc received slight injuries in the back from flying pieces of metal. Some members of the Aeronautical Technical Section who were present also received slight injuries.

GERMANY.

The Danish correspondent of THE AEROPLANE writes :—

Zeppelin Passenger-Carrying Record.

Der Flug-Welt of Leipzig states that in the test flight prior to its Alpine crossing, when delivered to Italy, the Zeppelin airship "L.61" remained in the air for 10 hours with 85 persons on board and attained an altitude of 1.5 mile.

The State of the Aircraft Trade.

The annual reports of a number of aircraft companies have now been published. For the time up to Sept. 30th, 1919, that of the Junkers Aeroplane Co., Ltd., in Aachen, shows a profit of 456,700 mark (against 165,500 mark in the first year since the formation, 1917) after a depreciation of 109,633 mark (122,022 mark the previous year). The reserve funds were increased by 243,000 mark and 213,700 mark (18,500 mark beside 5 per cent. dividends) carried forward. Of the various items, the plant was given at 1.4 million mark (1.48 million mark the foregoing year), debtors, including bank account, 1.73 million mark (1.82 million mark), stocks 2.61 (2.44) million mark, creditors 1.86 (2.97) million mark at a joint-stock capital of 2.6 million mark.

Whereas the Automobil and Aviatik A.G., which has definitely been moved from Mühlhausen, in Alsace, to Leipzig-Heiterblick, ends 1919 with a loss of 112,961.04 mark, and the Bavarian Aircraft Works, Ltd., in Munich, has a loss for 1919 of 1,468,797 mark against 347,812 mark profit last year (dividends 10 per cent., 25 per cent. in 1917, on a 3 million mark stock capital), the total income for last year was 1,082,701 mark (76,809 mark in 1918, 1,630,773 mark in 1917), besides an advance from 1918 of 40,313 mark, while the expense items are 2,772,940 mark wages and taxes and 83,383 mark depreciation.

The works at Hard of the Nuremberg branch of the Gothaer Waggon and Aircraft Works have just been completed, but await negotiation *re* electric current with the city and fuel councils before manufacture can start.

Albatros Fire at Johannisthal.

On Aug. 29th one of the 120 m. workshop sheds with materials and machinery at the value of 6 to 8 million marks of the Albatros Company at Johannisthal was destroyed by fire. In spite of the fact that the electric and telephone cables were damaged, several other works which had started to burn were saved by these means.

Prize for Small Aircraft Engines.

The south-west group of the German Air Navigation Association offers from its research fund prizes of 5,000 and 10,000 mark for the best designs of aero-engines for sporting aeroplanes, 10 h.p. maximum size, the complete aircraft to be fostered next by further prizes of 20,000 and 50,000 mark.

An Exhibition.

The picture department of the German Central Institute for Education is to hold a picture show from Oct. 4th to 9th with an aerial photo section to demonstrate their value and facilities for educational purposes.—E. H.

ITALY.

The Airship "Roma."

On Sept. 17th the Italian airship "Roma" made a flight over Rome. This vessel, which is of semi-rigid type, has a cubic capacity of 34,000 cubic metres. It has six engines of 400 h.p. and a speed of 64 to 74 m.p.h. The engines are in pairs and the airship is capable of 56 m.p.h. with only one pair of engines running. The newspaper *Epoca* states that the United States have entered into negotiations for its purchase.

The Italian correspondent of THE AEROPLANE writes :—

Soviet Workers and the Schneider Cup.

The elimination tests of the Italian machines entered for this cup were to have taken place on the 12th. The S.I.A.I. (Savoia) machines are two S.19s, one piloted by Janello, the other by Naval Captain Bologna, and each powered by a 500 h.p. Ansaldo motor. The Macchi M.19 entered has a 700 h.p. Fiat engine and is to be flown by Janetti, the smaller Macchi 12 being entrusted to De Briganti. The *mise au point* of these machines is being seen to by the Soviet workers, who have occupied the works.

The S.A.I.A.M. and Industrial Troubles.

The S.A.I.A.M. informs those whom it may concern that all engagements as regards their aeroplane services and their aerodromes in the province of Milan are unavoidably cancelled. Erba, near Como, is the only one of their aerodromes now available, therefore. This is due to the action of His Excellency the Prefect of Milan Province, who has forbidden free flying and commandeered the S.A.I.A.M. fleet. Similar arrangements are imminent for Turin and Province. One understands that several of the biggest aeroplane factories are now being run by the "workers."

The Caproni Giant Seaplane.

When at Milan early in the week I was told by Ing. Caproni's manager that the giant seaplane must still be regarded as a secret for a short time longer, but details are promised me in the near future.

The F.A.I. Congress in 1921.

The dailies report that the next congress of the F.A.I. will take place in 1921 at Rome or Venice.

The Redini Sparking Plug.

I have received news of the Redini sparking plug, which should do well in motors giving trouble with overheating and plug fouling. The body of the Redini is merely a cage, the electrode remaining visible almost to its business end

T. S. H.

NORWAY.

A Norwegian correspondent of THE AEROPLANE writes :—

A Norwegian-English Air Company.

A new air company has been established with English and Norwegian capital. The company has great plans, but the capital is not up to it.

First they intend to open firm mail and passenger routes between Norway, Denmark, Germany and England. The route will be traversed two or three times weekly in the winter and daily in the summer, if the weather is good.

Further, the company will arrange pleasure trips, take nature films from the air, and undertake photographic surveying.

The promoters have treated with the firm of Handley Page, Ltd., London, for delivery of, preliminarily, one seaplane of the F.3 type. This machine will probably be used on the route Kristiania-London this autumn, and carry 10 passengers and two pilots as well as the luggage of the travellers. Later on the traffic will be extended, and offers for four new seaplanes of the Handley Page type have been received.

In Kristiania it is necessary to build a hangar. In London they hope to be able to hire the place wanted.

The price will be stipulated at about 60 ore per English mile, and the trip Kristiania-London will cost about 420 kroner (£21).

The share capital is 300,000 kroner, of which two thirds is subscribed in England. The technical director of the company will be the aero engineer Mr. Odel Henrichsen and the commercial director an Englishman (Capt. Frobisher).

T. B. S.

UNITED STATES OF AMERICA.

The Wright Patents and Handley Page, Ltd.

On Sept. 16th in the Federal Courts the Wright Aeronautical Corporation brought an action against Handley Page, Ltd., the Aircraft Disposal Company and Mr. William H. Workman for alleged infringement of the Wright patents.

It is stated by the plaintiffs that Mr. Handley Page, when on his recent visit to the United States made arrangements for selling large quantities of British aircraft and aircraft materials in the States and that two disposals companies were formed to deal with this matter. Arrangements were also made for the formation of an aerial transport line. The plaintiffs object to this, and state that such under-selling would ruin the United States aircraft industry.

A Transatlantic Air Service.

It is stated that the Hamburg-Amerika Steamship Company, together with a prominent American firm of motor manufacturers, are financing a scheme for an airship service from Berlin to San Francisco via Paris, New York and Chicago. Fares will not be much in excess of those charged for existing surface transport methods

It is also stated that the British Air Ministry are interested in an airship line to New York and the Continent.

A Fatality.

Reuter states that two American aviators who were flying an aeroplane carrying mails were burned to death through their machine catching fire and crashing near Pemberville.

The First Aerial Derby Around the World.

The following "guff" comes from America :—

The Special Commission appointed by the Aero Club of America and the Aerial League of America made a visit to many countries which included a circling of the globe and has completed an organisation making possible the conducting of the First Aerial Derby Around the World. To ascertain the exact conditions existing, a test flight around the world is contemplated. A Handley Page aeroplane, type W.8, will be used, which is an improvement on the class of aeroplanes now used in the regular service between London and Paris, and London and other points in Europe, this aeroplane to be piloted by two of America's well-known and most experienced aviators.

The test flight will start from London, the aeroplane moving to the east. Aerodromes and landing fields are now in existence over the entire route from Tokio and from Seattle to New York, with suitable other landing conditions at points where stops be advisable or made necessary Complete details of this test flight, including the route, distances, etc., and the cost of transportation, is in course of preparation.

The capacity of the aeroplane to be used on this test flight is ten passengers, and it is proposed to divide the expense of the trip equally among the ten who may care to participate. Should the number of passengers making the trip be less than ten the expense to each passenger would increase in proportion.

While waiting for better political conditions to develop in various parts of the world now closed to aviation contests, the organisation work of the Derby has been pushed and tentative rules and regulations of the First Aerial Derby Around the World, including the notes of the Commission organising the same, have been translated into various languages and submitted to the Aerial Club of countries affiliating with the Federation Aeronautique Internationale, so that the affiliated clubs will be able to present their suggestions about the Derby at the meeting to be held at Geneva in September, at which the Aero Club of America and the Aerial League of America will be represented

If you or your friends would like to participate in the test flight, will you kindly advise us and additional information will be furnished.

SWITZERLAND.

The Monument to Chavez at Brigue.

On Sept. 12th a monument was erected in memory of Georges Chavez, who died as a result of an accident in the course of his attempt to cross the Alps in a Bleriot monoplane on Sept. 23rd, 1910.

Among those present were a brother of Chavez, the Prince Roland Bonaparte, representatives of the Peruvian Embassies at Paris and Brussels, representatives of the French Government, and the delegates of the F.A.I., including the representatives of the Royal Aero Club.

During the ceremony an escadrille from the Dubendorf Aerodrome flew over in honour of a dead aviator.

A GOOD RECOVERY.

His many friends will be glad to hear that Captain D. G. Westgarth-Heslam, who had a very bad crash on a Baby Avro when flying to Martlesham before the Aeroplane Competition, is doing very well. He is at present in the East Suffolk Hospital at Ipswich and is likely to be there for several weeks as his broken thigh, although doing as well as can be expected, is still giving trouble. Otherwise he is making a wonderful recovery and certainly the Ipswich doctors are to be congratulated on the way they have patched up his face. Considering that owing to collision with his compass Captain Heslam's face was practically reduced to produce, the doctors have made of it a very excellent rebuild. Captain Heslam will be glad to hear from any of his friends who care to write to him.

So far as one can gather, the accident was caused by the breakage of the universal joint at the foot of the control column, with the result that when Captain Heslam was landing in a small field owing to the choking of his carburetter jet the machine took charge when only 100 feet or so from the ground. He just managed to save an absolute nose-on crash by switching on his engine at the last moment, the choked carburetter having apparently freed itself for the moment.

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With Appendices compiled by

MAJOR V. A. H. ROBESON, M.C.,

and a foreword by

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THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

It has been found necessary in some cases to alter the dates of the lectures as given in the list issued last week, and a revised and more complete list is therefore appended. In some cases the date still remains subject to final confirmation.

Oct. 7th, 1920.—Sir Frederick Sykes, Hon. Fellow, "Civil Aviation."

Oct. 21st.—Sqdn. Ldr. R. M. Hill, Ass. Fellow, "A Comparison of the Flying Qualities of Single and Twin Engined Aeroplanes." Cecil Baker, "Night Flying."

Nov. 4th.—Wing Comdr. Flack, "The Human Machine in Relation to Flying."

Nov. 18th.—H. B. Irving, Ass. Fellow, "The Design of Aeroplane Control Surfaces, with special reference to Balancing." A. Fage, Fellow, "Airscrews."

Dec. 2nd.—"Airship Mooring," "Airship Piloting."

Dec. 16th.—H. Ricardo, "Possible Developments in Aircraft Engines." A. J. Rowledge, Member, "The Instalment of Aeroplane Engines."

Jan. 20th, 1921.—Lord Montagu of Beaulieu, Founder Member, "The Cost of Air-Ton Miles compared with other forms of Transport."

Feb. 3rd.—G. Dobson, "Meteorology and Aviation." Wing Comdr. H. W. S. Outram, "Ground Engineering."

Feb. 17th.—F. Handley Page, Fellow, "The Handley Page Wing."

March 3rd.—J. W. W. Dyer, "Airship Fabrics." Major T. Orde Lees, "Parachutes."

March 17th.—Capt. D. Nicolson, Ass. Fellow, "Flying-Boat Construction."

LIBRARY.

The following books have been received and added to the Library:—"Australian Meteorology," Griffith Taylor; "A Text-book of Aeronautical Engineering," Alexander Klemin; "L'aeronautique pendant la guerre mondiate," "In the Blue," Major S. H. Long; "Model Aeroplaning," V. E. Johnson.

EARLY MEMBERS.

Members will no doubt be interested to learn that in the course of examining various old papers in the records of the Society the Secretary has come across a number of original applications for membership, from among them the following aeronautical pioneers and prominent scientists: Dr. Alexander Barton, Octave Chanute, S. F. Cody, Henry Coxwell, Sir William Crooke, A. E. Caudron, Lawrence Hargrave, Thomas Moy, Hon. C. S. Rolls, Lord Rayleigh, Capt. Robert Falcon Scott, R.N., Percy Pilcher, Jose Weiss.

W. LOCKWOOD MARSH,
Secretary.

Sept. 17th, 1920.

THE ROYAL AERO CLUB.

GORDON-BENNETT RACE.

The Gordon Bennett Race will be held at Villesauvage, near Etampes, about thirty miles south of Paris, on Sept. 28th, 1920, and the representatives of United States, France and Great Britain will compete.

The Club has selected the following competitors to represent Great Britain:—

Pilot—F. P. Raynham. *Machine*—Martinsyde "Semiquaver." *Engine*—300-h.p. Hispano-Suiza.

L. R. Tait Cox. Nieuport "Goshawk." 320 h.p. A.B.C. "Dragonfly."

FLYING MACHINES FOR THE USE OF MEMBERS.

The Club has arranged with the Aircraft Disposal Co. for the exclusive use of six flying machines for the members. The following types have been selected: Sopwith "Pups," Avro, B.E.2d, and Armstrong-Whitworth. These machines will be kept at the Handley Page Aerodrome, Cricklewood.

All inquiries relating to hiring should be addressed to the Secretary of the Club.

HAROLD E. PERRIN,
Secretary.

Sept, 16th, 1920.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Sept. 14th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The name of Sqdn. Ldr. H. Gordon-Dean, A.F.C. (A.), is as now described, and not H. G. Dean as stated in "Gazette," Aug. 1st, 1919.

The classification of Flight Lt. E. L. P. Morgan (T.) is as now described, not (Ad.) as stated in "Gazette," Aug. 1st.

SHORT SERVICE COMMISSIONS.—The following officers are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their seny. in the substantive rank last held by them prior to the grant of this commn., except where otherwise stated:—

Flight Lt. (from Sqdn. Ldr.).—H. S. Shield, M.C., Sept. 7th.

Flight Lt.—C. Hanson-Abbott, Sept. 13th; A. S. C. Maclare, O.B.E., M.C., A.F.C., Sept. 9th; D. McLaren (Med.), March 31st (substituted for notification in "Gazette," April 20th); G. H. H. Maxwell (Med.), Aug. 24th.

Flying Officers.—F. E. C. Benstead, Sept. 10th; C. Hallawell, Aug. 28th; R. N. Hesketh, Aug. 26th; G. R. Hicks, D.F.C., Sept. 1st; A. F. James, Sept. 1st; R. H. McC. Sheppard, Sept. 1st; S. E. Sutcliffe, Sept. 2nd; A. C. Smith, Sept. 14th; S. H. Ware, Aug. 30th; H. W. Westaway, Aug. 27th; C. S. Whellock, Sept. 3rd.

Flying Officers (from Pilot Officers) (with seny. of dates indicated).—C. O. Anson, Sept. 7th; C. E. Durant, Sept. 13th; P. W. Lingwood, Sept. 1st; J. Spooner, M.M., Aug. 27th; S. H. H. Swanton, Sept. 11th.

NOTE.—Flight Lt. Shield will be placed at the head of the list of Flight Lts., and will retain seny. relative to officers who have been similarly gazetted to short service commns. in a lower rank than their previous substantive rank in accordance with his previous position on the gradation list.

The notification in "Gazette" of Dec. 5th, 1919, appointing Flying Officer V. W. Helps (A. and S.) to a short service commn. is cancelled.

SECONDING.—The following officers of the Royal Navy are granted temp. commns. in the ranks stated on seconding to the R.A.F. for three years:—

Flying Officers (Hon. Flight Lts.).—G. C. L. Dalley (Lt., R.N.), G. S. N. Johnston (Lt., R.N.), W. A. Elliot (Lt., R.N.), E. J. Nightingale (Paymr.-Lt., R.N.), C. M. E. Gifford (Lt. (actg.), R.N.), Sept. 6th.

Flying Officer.—A. W. Scott (Sub-Lt., R.N.).

The following Army officers are granted temp. commns. as Flying Officers on re-seconding to the R.A.F. for four years, retaining their original seny. in that rank:—

R. H. Wathes (Lt., Notts and Derby R.), A. A. Ward (Lt., R.F.A.), J. R. I. Scambler, A.F.C. (Lt., R.F.A.), E. M. Drummond (Lt., R. Highrs.), Sept. 6th.

AIR MINISTRY, Sept. 17th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—Flight Lt. J. H. Norton, M.C., D.F.C., resigns his permanent commn., Sept. 1st.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATH.

CULLEN.—On Sept. 16th, Walter Douglas Cullen, of "Mayfield," Leatherhead, late 5th East Surrey Regiment and R.F.C., died at a nursing home after an operation. He was the son of Mr. and Mrs. W. H. Cullen, of Mickleham Downs, Leatherhead, Dorking.

ENGAGEMENTS.

BLAKE—SHORE.—The marriage arranged between Mr. George Godfrey Leigh Blake, D.F.C., D.C.M., of the Inland Revenue Dept., late R.A.F., elder son of the late Rev. G. L. Blake, R.N., and Mrs. Blake, of 19, Redcliffe Square, S.W.10, and Vera Henrietta Louise, second surviving daughter of Charles R. Shore and Mrs. Shore, of Barn Gates, Binfield, Berks, will take place on Saturday, Oct. 9th, at 2.30 p.m., at the Old Church, Binfield.

HARDMAN—BUSHBY.—The marriage arranged between Capt. E. P. Hardman, D.F.C., R.A.F., and Miss Betty Bushby, Braydon Hall, Minety, Wilts, will take place at the Brompton Oratory on Thursday, Sept. 23rd, at 2.30.

MARRIAGES.

HERVEY—TUCKETT.—At All Saints Church, Clifton, Hamilton Elliot Hervey, M.C. (late R.A.F.), eldest son of Hamilton Law Hervey, I.C.S. (retired), was married to Beatrice Coldstream Tuckett (Biddy), youngest daughter of Mr. and Mrs. F. Coldstream Tuckett, of 27, St. John's Road, Clifton, by the Rev. M. P. Gillson, vicar, assisted by the Rev. Paul Stacy, vicar of St. Peter's, Coventry, uncle of the bride.

KENNARD—NEILD.—In Argentina, Caspar Kennard, M.C., late R.A.F., of Estancia "La Dorotea," younger son of Mr. and Mrs. Arthur Kennard, Frith Hall, E. Farleigh, was married to Evelyn Forrester, eldest daughter of Mr. and Mrs. F. Neild, The Bungalow, Flores.

MATHEW—ALEXANDER.—On Sept. 11th, at All Saints Church, London, N.W., Flight Lieut. Cecil George Mathew, R.A.F., second son of A. C. Mathew, of Cranford, Church Crookham, Hants, was married to Emily Geale Hester Lowry, youngest daughter of the late Colonel C. M. Alexander and Mrs. Alexander, of Termon, Carrickmore, Co. Tyrone, by the Rev. H. Trundle, M.A.

NORGARB—WIDGERY.—On Sept. 9th, at Oaklands Congregational Church, Capt. Eugene Norgarb, R.A.F., of Pretoria, was married to Vi, youngest child of Mr. and Mrs. John Widgery, of Uxbridge Road and South Molton.

TRAVERS-SMITH—HEATH.—On Sept. 8th, at St. Mildred's Church, Lee, Edward Travers-Smith, late H.A.C. and R.A.F., was married to Mollie, only daughter of Mr. and Mrs. J. E. Heath, of Lee, by the Rev. A. Ogilvy, M.A.

BIRTH.

LUCKING.—On Saturday, Sept. 11th, 1920, at 44, West Street, Ryde, the wife of Flight Lieut. D. F. Lucking, of a daughter.

EMPLOYMENT.

[Except where addresses are given, communications should be sent c/o THE AEROPLANE, 175, Piccadilly, W.1.]

Corporal, late R.A.F., 3½ years R.F.C. and R.A.F. cabinet-maker. Ground engineer's licence for all single-engined machines. Married. Willing to go abroad.—E. D.

COMING EVENTS.

SEPTEMBER.

27th, Mon.—Gordon Bennett Cup Meeting at Etampes begins.
28th, Tues.—Gordon Bennett Cup Race at Etampes.
Last week.—Latvian Trade Fair, Riga, opens.

OCTOBER.

2nd, Sat.—Gordon Bennett Cup Meeting at Etampes closes.
7th, Thurs.—R.Ae.S. lecture. "Civil Aviation," by Major-Gen. Sir F. H. Sykes, G.B.E.*
8th, Fri., 9th, Sat., 10th, Sun.—French Aviation Meeting at Buc.
21st, Thurs.—R.Ae.S. lecture. "A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Sqdn. Ldr. R. M. Hill, R.A.F.*
23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.
23rd, Sat.—International Aero Exhibition, Prague, opens.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes.
2nd, Tues.—International Aero Exhibition, Prague, closes.
4th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*
18th, Thurs.—R.Ae.S. lecture. "The Design of Aeroplane Control Surfaces, with Special Reference to Balancing," by H. B. Irving, "Airscrews," by A. Fage.*

DECEMBER.

2nd, Thurs.—R.Ae.S. lecture. "Airship Mooring," and "Airship Piloting."*
16th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Instalment of Aeroplane Engines," by A. T. Rowledge.*

JANUARY—1921.

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr. H. W. S. Outram.*
17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

MARCH—1921.

3rd, Thurs.—R.Ae.S. lecture. "Airship Fabric," by J. W. W. Dyer. "Parachutes," by Major T. Orde Lees.*
17th, Thurs.—R.Ae.S. lecture. "Flying-Boat Construction," by Capt. D. Nicolson.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30.

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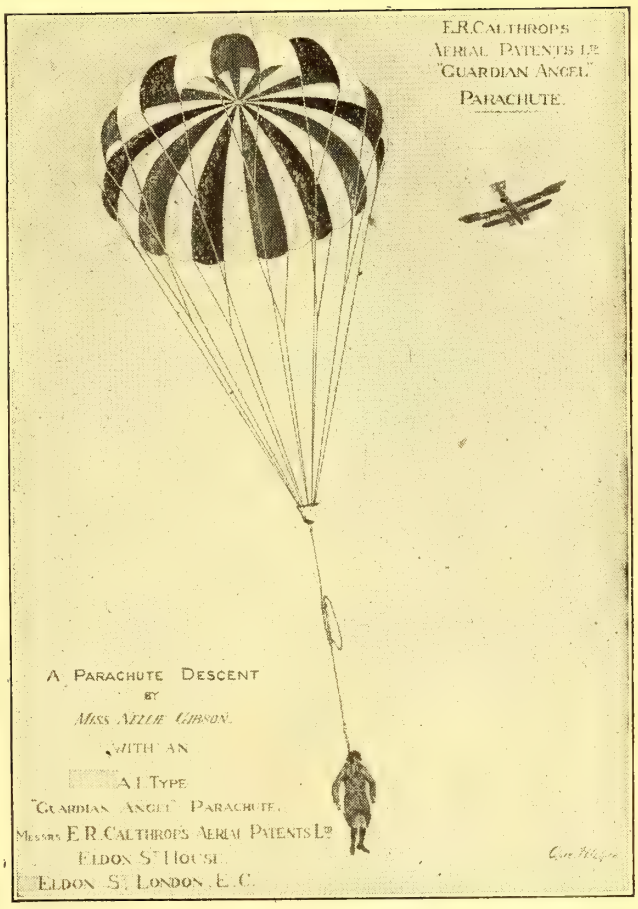

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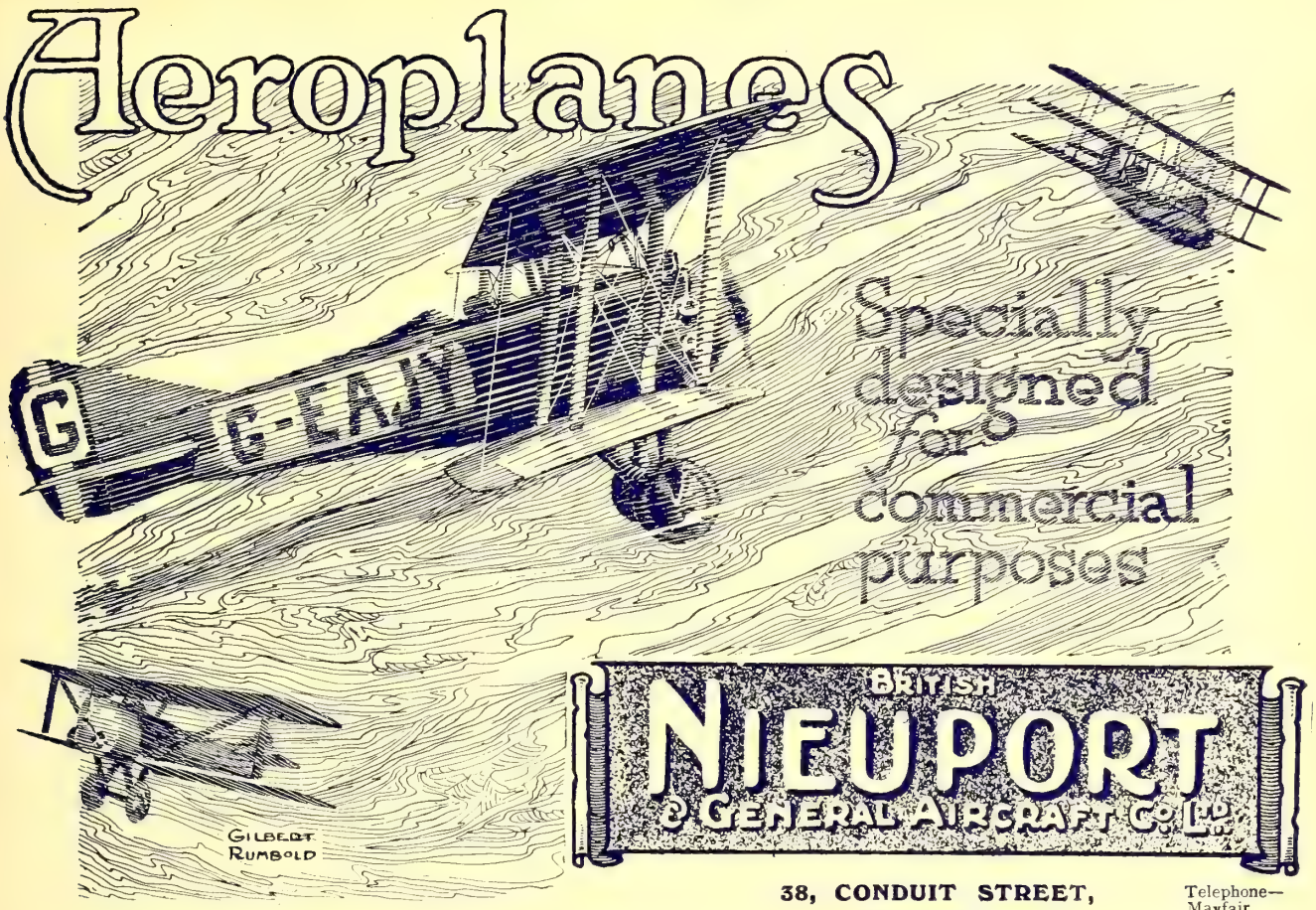

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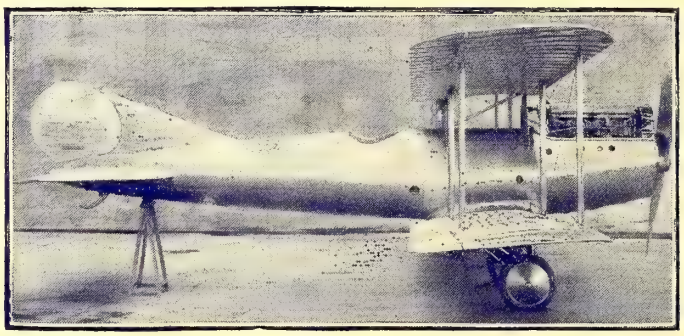

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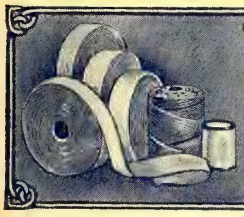

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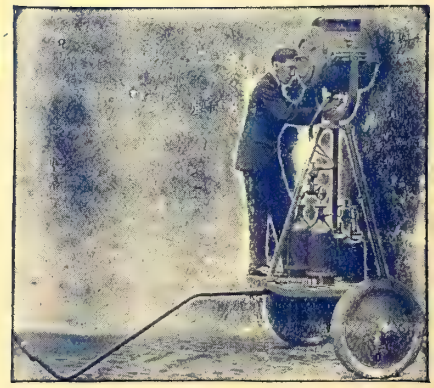

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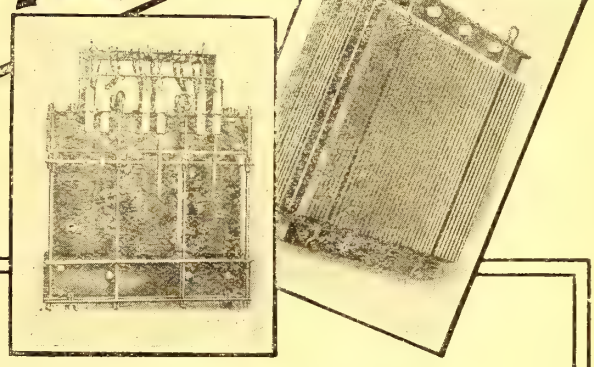

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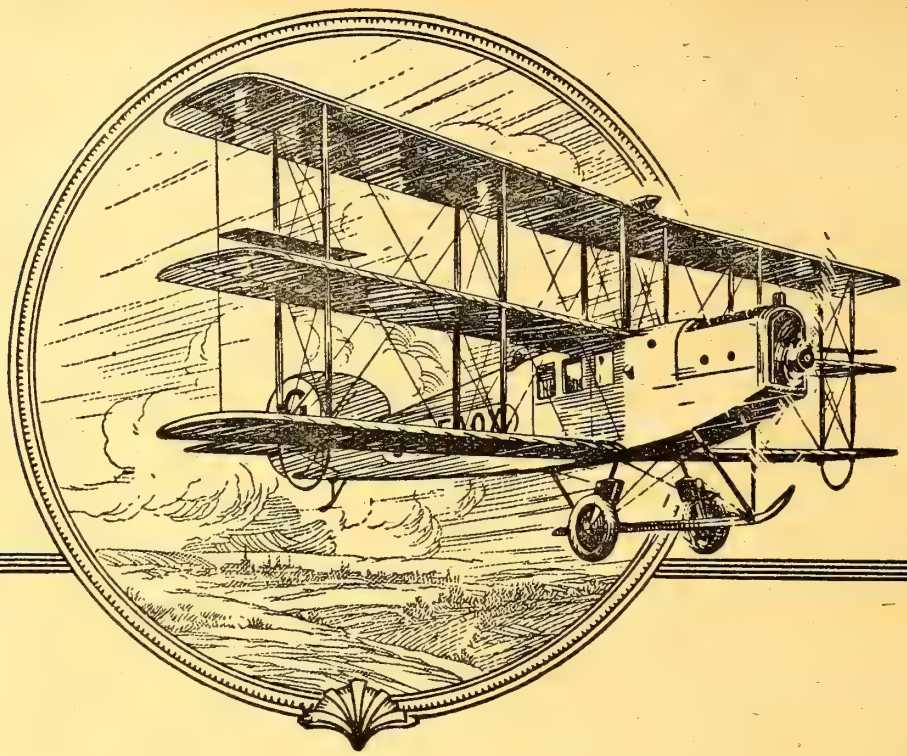

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ON WHO'S WHO IN AMERICA.

Some few months ago one ventured to discuss in this paper the internal affairs of our Teutonic and Celtic relations on the other side of the Atlantic. The matter is of some considerable importance to us on this side, for the Civil Aviation Authorities of the various countries which are represented by their respective Aero Clubs on the Fédération Aéronautique Internationale, and even the Naval and Military Authorities, are so considerate as to pay some attention to the advice and decisions of the various Aero Clubs which compose that Fédération.

This, after all, is somewhat natural, for each Aero Club is supposed to govern the Sport of Flying in its own country, and the Sport of Flying is, or should be, and will be, intimately concerned with Civil Aviation. That is to say, those who fly for sport must conform to the Civil Aviation Regulations. And the said Regulations must not hamper unduly the development of the Sport of Flying. And improvement in sporting aeroplanes is of importance to Naval and Military Aviation, just as the breeding of hunters and race-horses is of importance to the Army.

Hence the Aero Clubs of the various nations cannot be neglected by the Naval, Military, and Civil Aviation Authorities of their own nations, and consequently the Aero Club of each nation is of some importance to the aeronautical community of each other nation. This is one's reason for setting forth the affairs of the United States in this matter. Moreover, as lookers-on see most of the game, it may perhaps be an advantage to one's friends and enemies in the United States to see how their affairs appear from here. And perhaps the numerous readers of this paper in Canada may also be interested, seeing that Canada is so directly affected by the conduct of Military and Civil Aviation in the States.

A Review of the Situation.

When one last wrote on this subject the position was, briefly, that the American Flying Club was trying to displace the Aero Club of America as the representative governing body of the Sport of Flying in the United States.

The American Flying Club was formed after the War, ostensibly by flying officers of the U.S. Army and Navy Air Services, and was therefore to be considered as a purely amateur affair which would be at once a high-class social club and a governing body which would rule the Sport of Flying without fear and without reproach. Its enemies of the Aero Club of America told a very different story.

According to the Aero Club partisans the American Flying Club was composed of a lot of innocent young flying men ("boobs" was, one believes, the elegant word used in describing them) who were humbugged into joining the Club so as to give weight and power to a gang of grafters. The said grafters were supposed to be people in the automobile trade who were concerned during the war with aircraft production—very much as in England.

The Aero Club Member's Side of the Story.

The story was that when America heard the trumpet-call to arms, which took three years to carry across the Atlantic, a lot of cute financiers interested in the over-capitalised and heavily watered automobile firms—whose shares were so much waste paper in the hands of Wall Street brokers—rushed off to Washington and offered their services to the Air Services. Having grafted themselves into positions of some importance, they proceeded to hand out colossal orders for "airplanes" to the automobile firms with which they were concerned, with the result that the shares of these firms boomed to Heaven (far more than American guns or bombs ever did). Wall Street unloaded on the simple American business man. And so everybody was happy, except the people who were lumbered with the shares and the unfortunate American aviators in France who had to cross the German lines on obsolete or obsolescent French, Italian, and British aeroplanes because the American automobile firms, despite their screams about their colossal output, never turned out an "airplane" which was fit to cross the lines.

And so that was that, till the Armistice came and produced about fourteen little wars instead of one big war: one little war for each of President Wilson's sacred Points. The United States being out of all these little wars, much as it had managed to be out of the big war for so long, and as it managed to remain outside the League of Nations and its comic mandates, there was nothing for its Air Services to do, except be captured occasionally by Mexican bandits, and so it struck some of the automobile gang that it might be good to get going with a Club for disused aviators, and use it as a weapon in collaring the control of Civil Aviation in America. Which, after all, would be an entirely commendable act in the interests of the shareholders on whom Wall Street had unloaded.

That is roughly the version of the ordinary member of the Aero Club of America. Whatever may be the exact truth, the facts are that the Flying Club includes in its membership most of the really good fellows in the U.S. Air Services (and there are many of them), that the Flying Club ran the only aviation competitions held in the States in 1919-20, and that whatever it has done has been clean and above-board.

The Flying Club Side.

The anti-Aero Club side of the story is even funnier. According to this version, the villain of the piece is Mr. Henry Woodhouse, member of the Committee of the Club, or of the Board of Governors, or something of that sort. Also Mr. Woodhouse is the proprietor, director, editor-in-chief of that amazingly humorous publication *Aerial Age*, a species of aeronautical *Comic Cuts*, and of the official organ of the Aero Club of America, a paper called *Flying*, which is as dull as any official organ can aspire to be.

Unfortunately his enemies disinterred Mr. Woodhouse's adventurous past and proved that he was originally an Italian, and that his name in his home town is Enrico Mario T. Casalegno—of which Woodhouse is an honest literal translation, so there is no deception in that matter, but merely a change to accommodate the ignorant American. Still more unfortunately it was proved that Signor Casalegno had in a thoughtless moment, or in the exuberance of youth, knifed another Dago so that he died, and Signor Casalegno in consequence did two years of the best for manslaughter.

Now one holds that in America, where, according to the movies, manslaughter and man's laughter are so closely allied, it is entirely unreasonable to dig up an affair of that sort to a man's detriment. After all, what does a Dago or two matter one way or the other to the Teuton and Celtic races? Supposing the other Dago had knifed Signor Casalegno instead, does anybody imagine for a moment that the American Flying Club would be making a fuss about it all these years afterwards?

The Successful Waiter.

However, everything comes to him who waits, and Signor Casalegno, now become Mr. Henry Woodhouse, being like so many of his countrymen a competent waiter, waited till his opportunity came and then jumped into aviation with both feet. Unfortunately Mr. Woodhouse managed to put his feet into it too far, and incurred the enmity of a number of free-born Americans, among them Mr Bud Mars, one of the earliest American pilots. And so when he became really unpopular there were plenty of people ready to dig further into his private affairs.

Like so many exiles from Europe, voluntary and otherwise, Mr. Woodhouse remained in correspondence with those at home. Among them was said to be a Signor Santoro, who pursued the nefarious calling of a journalist in Italy. Unhappily Signor Santoro was later arrested and imprisoned as a spy in the pay of Germany, and, this sad news reaching Mr. Woodhouse's enemies, Mr. Woodhouse was promptly tarred with the same brush, which strikes one as very hard luck.

It would have been nearly as reasonable if people in this country had attacked one for one's friendship with dear

old Captain von Pustau, of the *Taglische Rundshau* (late of the German Imperial Navy), who was over here buying British seaplanes just before the war, when our brilliant Naval Officers in charge of the Nation's destinies refused to buy such silly contraptions. By the way! Can any reader of this paper in Germany, or any German-American reader, say what has become of Captain von Pustau? He was quite one of the best, and during the war he never failed in his articles to pay tribute to the gallantry of our fighting men. Still, one did not carry on an affectionate correspondence with him during the war, whereas seemingly Mr. Woodhouse did, somewhat naturally, correspond with Signor Santoro, and suffered accordingly.

Also, Mr. Woodhouse's pushfulness and enterprise led him to procure from Europe and publish in America, both before and after the United States joined the war, various photographs of new types of Italian, French, and British aeroplanes long before they were allowed to be published in the countries of their origin. This enterprise of his seriously perturbed the Intelligence Departments of the Allies, and led to strenuous efforts to prevent copies of his papers from getting to Germany *via* Norway, Sweden, Denmark, and Holland. So that naturally Mr. Woodhouse was not popular with the Naval and Military Authorities of the Allies, no matter how much *kudos* his enterprise may have earned for him among American small boys who like to make models of new foreign "airplanes."

The Real Crime.

Various other charges were laid against Mr. Enrico Mario T. Casalegno Woodhouse by his opponents, but enough have been cited to demonstrate the methods of the said enemies. Personally one can find no greater fault with Mr. Woodhouse than that he is obviously what we on this side of the Atlantic call a "hot-air merchant." He has printed more nonsense to the square inch about aviation than even the most popular writers on this unfortunate subject in this country. If he came here the editors of our daily papers would fall on his neck and there would be no further market for the Winchesters, Middletons and "Adjutants" of the lay Press.

Mr. Woodhouse's real crime is that he has brought American aviation into contempt among serious people by hot-airing about what American Military Aviation was going to do during the war and what American Civil Aviation was going to do after the war. He has helped a crowd of similar self-advertising gas-bags to foist themselves on the American Public and on the Aero Club as authorities on aviation when they know nothing about the subject. And he has consequently undermined the authority of the Aero Club of America just when it was desirable that the Club should be at its strongest. Therefore American Aviation has no use for what is called the "Woodhouse Gang."

Knowing this to be the state of affairs when one last wrote on this subject, one advised the Royal Aero Club and the other Clubs forming the Fédération Aéronautique Internationale to drop the Aero Club of America and back the American Flying Club. Even supposing that all the yarns about the latter were true, it was still better to back the Flying Club. If one wants a difficult job well done it is always better to set a clever crook to do it, and make it worth his while to do it well, than to leave it in charge of an honest fool—on the good old principle of "set a thief to catch a thief," or, more politely, "the old poacher makes the best game-keeper."

Apparently, so far as the United States were concerned, the position was that either the Flying Club would have to burst the Aero Club by sheer competition, or it would have to capture the Aero Club by nobbling a majority of its members. The latter was obviously the preferable proposition, for by doing so the new people in authority would obtain the power, and would have in addition the good name which still belonged to the Aero Club among those who did not know of its internal troubles. And that is what has happened.

How It Came About.

There has now been a really good blow-up in the Aero Club of America, and to-day the position is that the Aero Club remains the ruling power on the Sport of Flying in the United States, but it is run by the bright young brains who formed the American Flying Services. How it came about is briefly thus.

The Flying Club took the Sport of Flying into its own hands and organised the only two competitions of any account in the States since the war—namely, the New York-San Francisco and back (and *vice versa*) race and the New York-Toronto race. The Aero Club did nothing except talk about a perfectly fatuous Round-the-World race to be held at some future date, if any aircraft firms should be fools enough to go to the expense of financing competitors—which they would not do if they could and, under present circumstances, could not do if they would.

Emissaries from the Aero Club made trips to various parts of the World, to which the competitors are supposed to be going to fly, walk, or swim, as fortune may decree, and talked the most arrant nonsense that one has ever heard from human lips on the subject of flying. Not even an English Member of Parliament could have shot off as much pure guff (to use what is, one believes, the American idiom) in the time available. The Flying Club did not talk. It merely ran its races with conspicuous success. So the Flying Club was at least two up on the Aero Club.

Then Mr. Woodhouse got to work in the Law Courts. He demanded that the Governors of the Aero Club, who were seeking to come to an agreement with the Flying Club for an amalgamation, be prevented from "consummating their scheme of placing the Aero Club of America under the pernicious control of the Manufacturers' Aircraft Association."

By way of reply the Governors suspended him from membership of the Club on Aug. 4th because he had "brought legal action against members of the Board of Governors." And his paper, *Flying*, was discarded as the official organ of the Aero Club. In moving his suspension Mr. Henry A. Wise Wood, who had hitherto been regarded as more or less Woodhouse's friend, and who had been responsible for introducing Woodhouse into the Club, said: "I think he began one year ago to use the Club for his personal ends—to punish his enemies and to forward the feuds he was carrying on. He has attempted to govern the Club as if it were his own institution."

The Amalgamation Scheme.

Furthermore, the District Attorney's office had started in July an investigation into the collection and distribution of the National Aeroplane Fund of 1916. This fund amounted to more than $300,000 and was administered by Henry Woodhouse, Alan R. Hawley and Henry A. Wise Wood. When it was found that this fund had melted mysteriously a definite movement for the amalgamation of the Flying Club and the Aero Club began, as it was felt that some stronger control over the affairs and finances of the Sport of Flying in the States was needed. At the time of writing the latest news from America is that the state of this Fund is still being investigated, but the mere fact that it has required investigation seems to have been used as a weapon against Woodhouse.

Meantime, the members of the Flying Club, headed by the Chairman of their Amalgamation Committee, Captain Albert P. Loening, who will be remembered as a very popular member of certain R.F.C. Messes while he was on duty in England as a U.S. Army Air Service officer during the war, organised scientifically a frontal attack on the Aero Club, which was to be captured by the simple process of overwhelming the opposition with votes. So well was the attack prepared that at a meeting of the Aero Club held on Aug. 16th the 150 members present who supported the amalgamation scheme held, between their own votes and proxy votes, 500 votes in favour of their scheme against only five pro-Woodhouse votes, out of a stated membership of 1,400.

The Fight.

Woodhouse himself was not present. His end of the fight was conducted by Lieut. Rafe Emerson, of the U.S. Naval Air Service, formerly a mechanic in the Navy, and Major Charles J. Glidden. One who was present describes Emerson as appearing in uniform with all manner of wings embroidered thereon, much to the delight of everybody, the gossip being that one set of wings indicated his ability to fly backwards. Glidden will be remembered by many people in this country as a stout and elderly party, chiefly notable for doing eccentric motor tours under uncomfortable circumstances.

What Charles Glidden was doing in this galley is hard to understand, for what he does not know about aviation would fill all the books ever written on the subject. One can only imagine that his fondness for quaint tours by automobile led him to interest himself in the Aero Club's idiotic Round-the-World scheme, and that, having once embarked on the scheme, he determined to see it through, being impelled by that same obstinacy which forced him to go through with his tours.

Even that does not account for his backing a man like Woodhouse. So one can only imagine that he fought for the sake of fighting, and not because he had any personal interest in the affair. At any rate, he and Emerson, by using the old Parliamentary trick of talking nonsense to kill time and constantly jumping into the debate on points of order, managed to delay the proceedings so much that they were not over till after midnight.

The Flying Club, which has a membership of 1,300, held

a meeting which lasted half an hour and carried the motion in favour of amalgamation unanimously. The members cheered their President and Founder, Mr. Laurence La Tourette Driggs, for five minutes after the result was declared.

By way of making an end to a perfect day the members of the Aero Club decided, after defeating the Woodhouse faction, to move the effects and records of the Aero Club from Madison Avenue to the premises of the Flying Club at 11, East 38th Street, New York. This will therefore be in future the official address of the Aero Club of America.

And thus not only was the Woodhouse faction in the Aero Club of America defeated, but its position was captured complete, and the loot was duly removed to the territory of the vanquishers.

Attempted Competition.

It seems that possibly Mr. Woodhouse, who apparently has made much wealth out of his newspapers—unlike the proprietors of aeronautical papers in this country—intends to carry on a *guerrilla* against his conquerors by heckling and litigating for a year or so in order to bother everybody as much as possible. Also, it is rumoured that he intends to try to start an "Aerial League of the World," which, if it succeeded in setting up branches in all countries, as is apparently the idea behind the scheme, would compete with the existing Aero Clubs of all nations and with the Fédération Aéronautique Internationale.

Happily there is little prospect of Mr. Woodhouse's scheme succeeding. The smallness of his real knowledge of aeronautics is so well known to readers of his papers in all countries that there is no chance of any "League" of his being taken as anything but a very feeble joke. At the same time, it is well that the Aero Clubs which constitute the International Federation should be warned in time so that any attempt to raise branches of such a league may be nipped in the bud.

At any rate, the aeronautical community in America has called Mr. Woodhouse's bluff quite successfully, and we now know "Who's Who" in America. The result is eminently satisfactory, for the Flying Club, which is now the Aero Club, included all the really good fellows in American Aviation—as one stated when one last tackled this subject—and one desires to congratulate them on the success of their campaign. It is certain that their victory will prove to be a benefit not only to American but to International Aviation.—C. G. G.

TO THE DEPARTMENT OF CIVIL AVIATION.

The attention of the Department of Civil Aviation is directed to the following extract from the *Furniture Trade Record* :—

AIR POSTS AND "THE AEROPLANE."

Some time ago my friend, Mr. C. G. Grey, Editor of THE AEROPLANE, sent me some interesting particulars regarding the development of air ports. These were subsequently made the basis of a paragraph in these columns. In THE AEROPLANE for Sept. 8th there is an article from which I quote the following :—

"Some few weeks ago one made a serious attempt to interest the business community in the advantages of using the existing air mail services to and from Paris, Brussels, and Amsterdam. One hundred of the leading newspapers in Great Britain were selected for the experiment. To each of these was sent a copy of an article which appeared in THE AEROPLANE, setting forth what these Air Posts are already doing and how letters can be sent by air mail. About fifty of these papers were trade and technical journals selected from the membership of the British Association of Trade and Technical Journals; the other fifty were selected from among the leading daily and weekly papers in London and the Provinces. Of these 100 newspapers, so far as one has been able to discover, only four responded to the appeal."

The four mentioned are the *Daily Express*, the *Financial News*, the *Sphere*, and the *Drapers' Record*.

PUBLICITY AND ENTERPRISE.

Mr. Grey writes somewhat sarcastically about the average intelligence of the Press as evidenced by the neglect of this subject, but I venture to suggest, in justice to other of my contemporaries, that he may have missed their references as he seems to have missed ours. He will find the paragraph in the *Record* for Aug. 13th (page 210), and it quotes the Editor of THE AEROPLANE and acknowledges his courtesy. *And now it is surely fair to retort that the air-post people themselves display very little publicity enterprise, for they have neglected the Press altogether. Apart from Mr. Grey's efforts, they have been "winking in the dark" all the time!*

[The italicised lines at the end—which are in ordinary type in the original—seem to sum up the whole situation admirably. All the fuss and pother of a Conference at the Guildhall would have been unnecessary if the Department of Civil Aviation and its Publicity Department had handled the Trade and Technical Press in the right way, for it is the Business Community that must learn to use air mails.

One is grateful to the *Furniture Trade Record* for its handsome acknowledgment of this paper, and one is glad that the Press-cutting agency failed to send the first extract, for if it had arrived this excellent lesson to the Air Ministry would not have been written.—C. G. G.

THE AERO CLUB'S SPORTING FAILURE.

It is very much to be regretted that the sporting effort of certain members of the Royal Aero Club to get the racing machine of the late Sopwith Co. ready for the Gordon Bennett Race was not crowned with success.

Many difficulties were overcome. The liquidators of the Sopwith firm refused to loan or hire the machine for the race, though it was in their power to do so, provided that they were indemnified against loss. Therefore the Aero Club sportsmen arranged to buy the machine—which is actually worth the price of scrap metal and firewood for all practical purposes—at quite a reasonable figure.

Then the aforesaid liquidators refused to allow the purchasers' mechanics to use the empty floor of the Sopwith factory for the erection of the machine and the installation of the engine. This difficulty was overcome thanks to the sporting owner of a garage in Kingston who offered space in his garage for the purpose.

The Bristol Aeroplane Company, Ltd., had been informed on Sept. 10th by Sopwiths that the engine would not be required. In consequence the engine was handed over to the Engine Department for experimental work. For ten days the progress of this work was continuous. On Sept. 20th the engine was asked for by the Aero Club sportsmen. Inquiries were at once made and it was found to be impossible to overhaul and retest the engine in time to do justice either to the pilot or the engine designers. It is regrettable that modern labour conditions prevent the adequate execution of a non-stop job lasting two or three days even though the object of the work was the maintenance of the sporting supremacy of Great Britain.

Attempts were then made to find another engine complete. The Air Ministry was splendid, and though the Department of Supply and Research could not actually loan an engine without an Air Council meeting to sanction such action—for which meeting there was no time—the Department offered to stand down in favour of the Club in the matter of any engine not actually delivered. Unfortunately no such engine was ready for delivery.

Then it was alleged that an engine ready for test had been sent from the works to a certain firm to do trials. The firm in question was unable to discover the engine, and nobody else could ascertain its whereabouts. So apparently there is a perfectly good "Jupiter" engine wandering about the country without an owner.

Meanwhile there has been a perfectly good Gordon Bennett racer standing without an engine, and Great Britain is represented by two machines (the pilot of one of which is ill at the time of writing) and the American team is in possession of six machines, a ton or more of baggage and spares, and a crew of followers numerous enough to run a factory.—C. G. G.

THE GORDON BENNETT AVIATION CUP RACE.

For the Gordon Bennett Cup Race, to be flown on Sept. 28th, entries were received from Great Britain, France, and U.S.A., Great Britain was to be represented by Mr. Raynham on the Martinsyde "Semiquaver," and Mr. Tait-Cox on the Nieuport "Goshawk." Mr. Raynham and "Semiquaver" arrived by road, but Mr. Tait-Cox went by air with "Goshawk."

He flew to Lympne on Sunday night and crossed on Monday.

Mr. Roland Rohlfs, the pilot of the Curtiss "Texas Wildcat" entered by Mrs. S. E. J. Cox, has crashed. No details are to hand, but the sister machine was also withdrawn.

The remaining U.S.A. machines were the Army-entered "Verville" with 600-h.p Packard and the Dayton-Wright with 260-h.p. Hall Scott engine.

The French entries were MM. Sadi-Lecointe and Kirsch in Nieuports, and de Romanet in a S.P.A.D.

The winner was M. Sadi-Lecointe.

AIR TRANSPORT IN BELGIUM.

By E. V. QUESTIER, late Editor *The Belgian Review*.

Air transport, owing to the total closing of all frontiers during the war, has been a staggering novelty for Belgium. Whilst the use of the aeroplane for military purposes was only too well known in those years of enemy occupation, its adaptability to peaceful commercial pursuits was hardly realised by the great majority of the Belgians.

Thus did it happen, for instance, that although the enemy had dotted the maps with countless aerodromes, landing places and sheds, all of which might have been put to some good use, the first peace aviation exhibition took place in a foreign neutral country, and not on Belgian soil.

Since the Armistice, however, great strides have been made with the indispensable propaganda for air travel and transport, and, to some extent, it may be said that Belgium possesses one organisation the like of which is to be found nowhere else.

S.N.E.T.A.

I refer to the Syndicate National pour l'Etude des Transports Aeriens, better known under its composite name of SNETA.

This syndicate was formed last year, and consists, amongst others, of the following influential bodies or persons: Banque d'Outremer, Societe Generale de Belgique, Banque de Bruxelles, Banque de Paris des Pays Bas, Banque Industrielle, Societe Mutuelle Mobiliere et Immobiliere, Compagnie de Congo pour le Commerce, Credit Anversois, Credit General Liegeois, Baron Lambert, Messrs. Philippson, Baron de Macar, Chevelier de Lamine, A. de la Hault.

With ample capital, and the power and means to call for more, this syndicate set about, first to vulgarise aviation, then to create the initial services, and to foster and encourage enterprise.

At an early date the SNETA obtained the use of Sart (near Spa), Evere (near Brussels) and Wilryck (near Antwerp), for aerodromes, and in each place demonstration flights and short passenger trips are being held daily. The public seems to have taken readily to the new sport, as the following figures show:

Flights at Spa in Aug.: 28; passengers 39. Passengers in Antwerp (summer season), 800. Flights at Brussels since the creation of the SNETA: 122; passengers 3,316. (All figures up to Sept. 1st.)

The services at Antwerp are under the command of Lieut. Flt. Cmdr. Jean Olyslagers, late of the Belgian Air Force.

AN INTERVIEW.

In a long conversation, this well-known aviator, brimful of enthusiasm, explained to me that the greatest difficulty the SNETA has met up to now is to decide the municipal and other authorities to grant permanent facilities for aerodromes. Public opinion is backing aviation, and divers means are used to keep it up to concert-pitch. In Antwerp, for instance, nearly every street has a large poster, generally over a café or some public building, and showing "Flying at Wilryck! Enquire and Book Within." The services seem well combined, and facilities for indulging a desire for a flight are such that the wish has no time to get stale.

The SNETA is acting quite efficiently in other directions. A Press bureau is keeping local papers all over Belgium supplied with aviation news. Direct advertising, first by means of "questionaires" sent to all firms and persons likely to use air transport, then by regular reminders, is also maintained.

AERIAL SERVICES.

Regular services from Brussels to Paris and from Brussels to London are running twice daily, and are meeting increasing support, the goods rates being as follows:—

Brussels-Paris.—1 to 5 kg., 7.50 fr. per kg.; 5 to 10 kg., 6.50 fr. per kg.; 10 to 20 kg., 5.50 fr. per kg.; over 20 kg., 4.50 fr. per kg.

Brussels-London.—1 to 5 kg., 9 fr. per kg.; 5 to 15 kg., 8 fr. per kg.; 15 to 50 kg., 6.50 fr. per kg.; over 50 kg., 6 fr. per kg.

The passage fares have since Sept. 6th been reduced to 400 fr. single and 650 fr. return.

In the Belgian Congo, the SNETA has organised an air service in connection with arrivals and sailings of the mail boats from Antwerp; the air line going from Stanleyville to Kinshasa.

As regards the air mail between London and Brussels and *vice versa*, its use as long as the mail boat services remain disorganised as they are should be of extreme efficiency in various respects. (Why, by the way, pre-war rail and boat services in respect of mail remain inadequate is a deep and unfathomable mystery.) Things being, however, as they are, the air mail should save a full day to mail posted in time for the daily aeroplane. Here, however, as in the matter of aerodromes, the official minds have been at work. From personal investigations I have been unable to find *one* business man in Antwerp who knew how to speed his mail. Everyone knows that there is such a thing as air mail to London and to Paris, but where and when to post are dark mysteries; and, curiously enough, the rates for air mail letters from Belgium are not the same as the return to Belgium.

Of the various passenger services, the line Brussels-to-Paris has by far had the greatest attraction.

On the whole, it may be said that the SNETA organisation is one whose efforts on behalf of commercial aviation are both novel and efficient; given some more pliant administrations and some less mandarin-minded officials, air travel should before long become commonplace and in general use.

THE DISASTER AT HAYES.

On Saturday last, between 12.00 o'clock and 13.00 o'clock, a Centaur 2a, owned by the Central Aircraft Company, of Northolt, which was flying with 5 passengers, fell to the ground and killed all except one of the occupants.

The pilot was Mr. Frederick Benjamin Goodwin-Castleman, an ex-officer of the R.A.F. He took certificate number 5,351 on June 8th, 1917, and has been chief pilot of the Central Aircraft Company for eighteen months.

Of the other victims, Miss Imelda Mary Trafford was one of the few lady pilots then flying. She had certificate number 7,879, for which she completed her tests on June 24th last. She was a very fine pilot indeed and in her death aviation has suffered a severe blow. Mrs. and Miss Wilkinson were the wife and daughter respectively of the aerodrome caterer. Mr. Rowlands was the aerodrome caretaker, and the only surviver was his daughter, who died on Monday evening.

The machine was the twin-engined "Centaur 2a" with two 160-h.p. Beardmore engines, which went through the Air Ministry's tests for the competition at Martlesham.

From an eye-witness who was most competent to judge, it seems that the port engine, which was not running well at the start, cut out at about 500 ft., and the machine went into a left-hand spin.

Everyone will sympathise with the Central Aircraft Company and the relatives of the deceased in their loss. The company are one of those who in a quiet way have been working hard in furthering civil aviation and it is hard luck that the first serious smash since the start of civil aviation should have occurred in their machine.—G. D.

THE SCHNEIDER CUP RACE, 1920.

The Italian correspondent of THE AEROPLANE writes:—

The only pleasant thing or circumstance in connection with this unfortunate occurrence seems to have been the sinless flying from start to finish of the winner—Nav. Lt. Chevalier Luigi Bologna, one of Venice's better-known aces. He boldly emerged from shelter places long after the judges' and time-keepers' deep-sea motor-launches had retired (transferring their valued occupants to torpedo-boats), took the air in a wind estimated at as much as 50 kilometres per hour on the first day of the tests and kept it for well over the hour, till the buoys became invisible that is. The anchored gas-bags had long since given up the ghost!

In this period he had succeeded in getting round the course five times, his medium time being 146 1-3 kilometres per hour, the best 135 4-8. The race was postponed till the weather permitted, which was on the 21st.

Zanetti, who had forfeited his entry as he could not get the Macchi 19, with 700 F.I.A.T. engine, into fighting trim in time, and Ianello, who was afflicted with magneto trouble on the Savoia 19, 450 Ansaldo, having done likewise, Bologna flew round the course on the Savoia 12 (also powered by the aforesaid big Ansaldo motor) in 2 hrs 10/35 at a medium speed of 152½ per hour. The distance to be flown is 375½ kilometres. The wind was about from 4 to 9 metres and from south-west. Sea rough; and the height at which the seaplane flew from 200 to 400 metres.

The judges afterwards declared the Cup won by the Italian Aero Club, and Lieut. Bologna winner of the 30,500 francs (French) of prize-money.

It is to be hoped that the unfortunate fact of the cancelling of all the Allied entries, which was not generally known till almost the last moment—and has given rise to the idea among the men in the street, and perhaps naturally, that they did not care to play in his yard or were hopelessly outclassed—will be smoothed down by the presence of the foreign representatives and chargés d'affaires, England, France, and U.S.A. being well to the fore in this wise respect.

The organisation appears to have been excellent, and every right-thinking person will sympathise with those responsible for it on the hard luck of having had to fight against the slings and arrows of both the weather and the times we live in.—T. S. H.

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Telephone: Gerrard 4500.
Telegrams: Martinsyde, Piccy, London.

NAVAL AND MILITARY AERONAUTICS.

The R.A.F. Appointments and Gazettes will be found on page 602.

MILITARY.

EXTRACTS FROM WAR OFFICE COMMUNIQUES.

Sept. 21st.— . . . North of Baghdad also all is quiet. Aeroplanes fired on and dispersed a hostile concentration 16 miles south of Samarra. . .

Sept. 23rd.—On the Middle Euphrates the situation is quieter. The pilot and observer of an aeroplane, who fell into the hands of tribesmen after a forced landing, were brought into Feluja, where there is a British garrison. These tribesmen had refused to hand them over to a Sheikh hostile to us, who had demanded their surrender.

Sept. 25th.— . . . One of our aeroplanes dropping stores on the defence vessel *Greenfly*, which is aground in the Euphrates, was shot down in the river by tribesmen, who carried off its occupants on their reaching the river bank.

Lower Euphrates.— . . . Two intensive air raids on Samawa town appear to have produced a demoralising effect on the hostile inhabitants, who are said to be withdrawing in large numbers to the eastward. . . .

In the Diala division . . . the main remaining centre of the trouble is at Deltawa, where a body of 500 tribesmen have advanced to the right bank of the Diala just above Bakuba. Aerial action against this band has inflicted some casualties on them.

AIR FORCE.

R.A.F. CADET COLLEGE PROFESSORSHIP.

The Air Ministry announced on Sept. 21st :—

Doctor O. S. Sinnatt, M.C., D.Sc., M.Sc., at present Lecturer in Mechanical Engineering, London University, King's College, has been appointed to the Professorship of Aeronautical Science at the R.A.F. Cadet College, Cranwell.

The following details as to Dr. Sinnatt's career are also supplied by the Air Ministry :

Dr Sinnatt was born in Liverpool in 1882, educated at the Manchester College of Technology and Owens College, University of Manchester. He is a Master of Science and Bachelor of Science, Manchester University, and Doctor of Science, London University.

He has been Lecturer in Engineering at King's College, University of London, since 1905. During the early part of the war he held various posts with the University of London Officers' Training Corps, for a period being in charge of the Training Camp, Perivale. He was afterwards transferred to the London Regiment and posted to France early in 1917, rising to be second in command of the 2/2 Battalion of that regiment. He was severely wounded at Poelcappelle in the latter part of 1917 and was awarded the Military Cross. Later, after his return from hospital, he was attached to the Air Ministry as a Technical Officer and served in the Instrument Division.

ROYAL AIR FORCE.—CADET EXAMINATION.

The Air Ministry announced on Sept. 25th that :—

An examination for entrance into the Royal Air Force will be held on Nov. 16th, 1920, and the following days.

Forms of application for entry will be furnished on application by letter addressed to the Secretary, Civil Service Commission, Burlington Gardens, W.1. The form should be completed and forwarded to the Secretary, Civil Service Commission, *not later than Sept. 30th*. No form of application received after Oct. 14th will be accepted under any circumstances.

At this examination not less than 20 cadetships will be open to competition, less such number as may be awarded to King's Cadets, King's India Cadets, or Honorary King's Cadets. This number will include the grant of not less than one Prize Cadetship.

The examination will be conducted in accordance with the Provisional Regulations for the Royal Air Force (Cadet) College, Cranwell (F.S. Publication 121), and amendments thereto obtainable from H.M.S.O., Imperial House, Kingsway, or from any bookseller. The examination will be held in London or at other centres in the United Kingdom. The fee for the examination in London will be £4. At any other centre the fee will be £5 in addition to the local fee payable in some cases to the College and School Authorities

The amounts payable towards the cost of uniform and books are now £65 prior to first joining, and further payments of £25 and £10 at the commencement of the third and fourth terms of residence, respectively.

The limits of age for entrance to the College will be from 17½ to 19 years (the half being reckoned by calendar months).

The candidate must have attained the age of 17½ and not have attained the age of 19 on Jan. 1st, 1921. Exception is made in the case of those who have had various classes of service. In these cases the maximum age is 21.

Additional marks will be awarded to candidates with various classes of service, as follows :—

(a) Candidates who qualify for certificate "a" in either the Senior or Junior Division of the Officers' Training Corps, a secondary school, or a recognised Territorial Force Cadet Unit will be eligible for the award of the actual marks obtained at the Certificate Examination—i.e., from 300 to 600.

(b) Candidates who were serving on Jan. 1st, 1920, or who had served prior to that date as Officers, Warrant Officers, Non-commissioned Officers or Men of the Royal Navy, Royal Marines, Regular Army, Royal Air Force, Special Reserve, Indian Army Reserve of Officers, Militia, Territorial Force, or Forces of the Overseas Dominions, and who have completed four months' continuous service and can furnish certificates to that effect, will be entitled to an award of 400 marks.

(c) Candidates who were serving on March 1st, 1919 (or who had served prior to that date), in the Senior Division of the Officers' Training Corps, and can furnish a certificate to that effect, will be entitled to an award of 400 marks

The certificates required in (b) and (c) above will be rendered on a form supplied to applicants by the Civil Service Commissioners.

Under no circumstances will a candidate be awarded the 400 marks for service in addition to the marks gained in certificate "A" examination.

No candidate will be accepted unless he is pronounced physically fit for entry into the Royal Air Force by a Medical Board.

Candidates are warned that if they elect to be examined at centres other than London it will still be necessary for them to come to London for their Medical Examination shortly after the termination of the educational examination.

Parents and guardians are strongly recommended, in order to lessen the chance of subsequent disappointment, to have their sons or wards examined by a medical practitioner previous to their becoming candidates for a commission in the Royal Air Force. A pamphlet giving details as to the standard of medical fitness demanded can be obtained on application to the secretary, Air Ministry (D.M.S.).

Cadetships at the Royal Military Academy, Woolwich, and the Royal Military College, Sandhurst, will also be open for competition at the same examination. Particulars may be obtained on application to the Secretary, War Office, Whitehall, London, S.W.1.

A candidate who fulfils all the necessary conditions may compete for a Cadetship at the Royal Air Force Cadet College and also for a Cadetship at the Royal Military Academy or Military College. Candidates desiring to do this must express definitely their order of preference before the examination begins.

Candidates who compete for entrance to the Royal Air Force Cadet College, whether as first, second, or third choice, must undergo the Royal Air Force Medical Examination. A candidate will be accepted as fit for the Army Colleges if he passes the Royal Air Force Medical Examination and is within the standards set by the Army.

Philosophic Anarchy.

It has been said that "in a multitude of councillors there is wisdom." Evidently, judging by our present councillors, it would seem that a vast multitude of them would have to be squeezed very hard in order to extract a very small amount of wisdom, if the following paragraph, taken from the *Evening News* of Sept. 22nd, may be taken as an example of co-operative common sense :—

"R.A.F. SNUBBED.

"Bermondsey Council refuse to allow the R.A.F. to place recruiting posters in public places.

"One of the councillors, Miss Jessie Stephen, said the Government could surely find better work for unemployed men than teaching them how to bomb defenceless women and children."

Miss Jessie Stephen seems to have forgotten that if we had not trained men to handle aeroplanes during the war, she and other defenceless women and children would have been considerably worse bombed than they were, let alone that they might have been conquered by Germany, so that they would now be living under a firm and ruthless Government which would not permit Miss Stephen and her like to talk anarchistic nonsense.

Beating swords into ploughshares may be an excellent method of increasing the nation's food supplies, but before doing so it is always advisable to make quite sure that the other fellow is not employing the still cheaper method of beating ploughshares into swords with which he may commandeer the food supplies and other property of the defenceless pacifist and the philosophic anarchist.—C. G. G

THE AMPHIBIAN COMPETITION.

The following are the officially-communicated results to date of the Government Competition for Amphibian Aircraft :—

FAIREY.

Machine .....Float Amphibian
Pilot..Lt.-Col. Nicholl, D.S.O.
Engine .....450 Napier (Lion)
High Speed ..... ——
Slow Speed .....20/9/20 : 47.25 knots*
Reliability 17/9/20
Economy .....W/G = 8.5*
Self-controlled Flight ... ——
Getting Off SEA...23/9/20 : 104 ft.
Getting Off LAND ..... ——
Mooring Out (24 hrs.) 26-27/9/20†
Towing ... . ——
Taxying 21/9/20
Figure 8 ....23/9/20
Anchoring and Picking Up Mooring 23/9/20
Landing (over balloons) run
Getting Off and Landing (rough water) ..... ——

SUPERMARINE.

Machine .....Boat Amphibian
Pilot .....Capt. J. Hoare
Engine 350 Rolls-Royce "Eagle"
High Speed .....23/9/20 : 82 knots
Slow Speed .....23/9/20 : 48 knots
Reliability 21/9/20
Economy .....W/G = 11.88*
Self-controlled Flight 22/9/20
Getting Off SEA...22/9/20 : 102 ft.
Getting Off LAND...24/9/20 : 60 ft.
Mooring Out (24 hrs.) 24-25/9/20
Towing 22/9/20
Taxying 22/9/20
Figure 8 .....22/9/20
Anchoring and Picking Up Mooring 24/9/20
Landing (over balloons) run 27/9/20, 321 yds.
Getting Off and Landing (rough water) 22/9/20

VICKERS.

Machine ...Boat Amphibian
Pilot .....Capt. Cockerell
Engine ...450 Napier "Lion"
High Speed ...8/9/20 : 105.2 knots
Slow Speed .....14/9/20 : 45.25 knots
Reliability 7/9/20
Economy .....W/G=9.75
Self-controlled Flight 7/9/20
Getting Off SEA...22/9/20 : 340 ft.
Getting Off LAND...14/9/20 : 177 ft.
Mooring Out (24 hrs.) 20-21/9/20
Towing 22/9/20
Taxying 20/9/20
Figure 8 .....20/9/20
Anchoring and Picking Up Mooring 20/9/20
Landing (over balloons) run 27/9/20, 382 yds.
Getting Off and Landing (rough water) 22/9/20

* These figures are liable to correction.
† Failed to do flight at conclusion.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

In an article below the general trend of German experiments with superchargers for altitude flying is discussed.

This article is of compound origin, in that a translation of Herr Noack's history of superchargers with his own comments thereon added was prepared by Mr. Hildesheim. This was then remodelled with further comments based on French and American work in the same direction by Captain Sayers.

Specifications issued by the Air Board of Canada for certain classes of aircraft needed for exploratory and forest patrol in that counrty are summarised on page 584.

A short description of the Supermarine Amphibian entered for the Air Ministry Competition appears in this issue.

GERMAN SUPERCHARGER DEVELOPMENTS.

Despite the generally successful results obtained by the German engine designers with super-compressed and over-dimensioned engines for high altitude flying, they were not content with these results alone, but carried out some considerable amount of experimental work in connection with super-chargers. A somewhat verbose description of the course of these experiments has been written by Herr W. G. Noack, before the war a member of the engineering staff of the famous German-Swiss firm of Brown-Boveri and Co., and during the war concerned in the development of German "Giant" aircraft. From this article the information whereon the following comments are based has been extracted.

Herr Noack appears to have designed a type of supercharger in 1916, and to have handed over his drawings to the German authorities at the beginning of 1917, and to have arranged for experimental construction to them by the Brown-Boveri works at Mannheim.

Herr Otto Schwade, of Erfurt, manufacturer of the Stahlherz rotary engines, almost simultaneously had attacked the same problem and had taken out patents covering the design of superchargers. Later the A.E.G. and the Siemens-Schuckert concerns attacked the problem. So far as can be discovered no German supercharger on the lines due to Prof. Rateau has appeared, and instead of utilising the energy of the exhaust gases from the engine cylinders to operate the air compressor, all the German superchargers have been driven either by the engine itself, or by a special engine installed for that purpose. The latter scheme has only been used in the case of large multiple-engined craft.

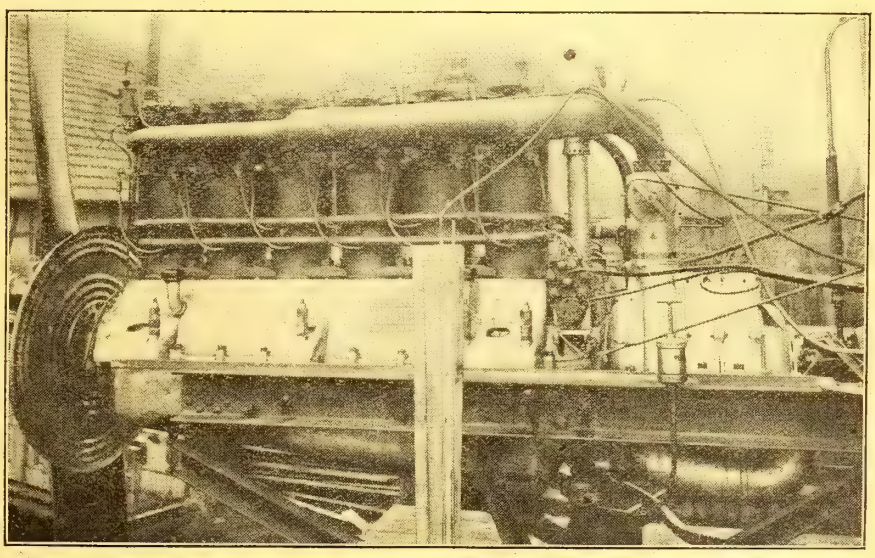
The fact that large volumes of air are required to be compressed only to a relatively low pressure indicated to German, as to Allied, engineers that the turbine type of compressor alone could meet the necessarily exacting requirements of low weight and small space, and as the turbo-compressor is necessarily a high speed affair, the method adopted of driving from a petrol engine necessarily involved gearing up between the engine and the turbo-compressor.

In order to lessen the troubles likely to be met with on such gears the German superchargers were all designed for speeds not greatly exceeding 10,000 r.p.m. and thereabouts—which relatively low speed necessitated the use of multiple-stage compressors.

In this respect the exhaust turbine-driven supercharger stands at a considerable advantage, as speeds of rotation of 30,000 r.p.m. can be attained without intermediate gearing, and a simple single-stage centrifugal blower can be made to suffice for the range of compression needed in practice. This makes for a lighter and more compact installation.

Despite the adoption of an inconveniently low speed of rotation for the compressors the German designers by no means escaped from gear troubles. It needs but a little practical experiment with one of the very common American hand-driven grinding wheels to come by an appreciation of the very large shocks which can be applied to a train of gears of high ratio, fitted with a flywheel at the high speed end, and with a somewhat irregular turning moment applied at the other.

This effect, in the case of a supercharger driven by an internal combustion engine, particularly at the period of starting



A GERMAN SUPERCHARGER.—A supercharger of Schwade design coupled to a 260-h.p. Mercédès engine on the test bench. It is driven through a train of gears from the crankshaft end, and discharges its compressed air directly to the carburetter intake, which is bolted directly to the supercharger. The photograph gives an excellent idea of the bulk of a supercharger of this type.

up and in the event of missfires, is such that neither any practical train of gears, nor any reasonably proportioned engine crankshaft could hope to survive it. Not only this, but even with the most evenly running of engines there were possibilities of torsional vibrations occurring, and German experience with gear drives to airscrews did not encourage the taking of any risks in this respect.

Various expedients were adopted to secure immunity from troubles on these two scores.

The Siemens-Schuckert firm arranged to drive their superchargers by gears from the airscrew end of the engine shaft, thereby using the airscrew as a flywheel and relieving the engine crankshaft as a whole from the loads likely to result from irregular torque.

The Brown-Boveri firm used a spring drive allowing a relative displacement between crankshaft and supercharger, and in both A.E.G. and Schwade designs automatic centrifugal clutches, arranged to engage only when the engine was turning at at least 600 r.p.m., and slipping on the occurrence of any abnormal torque, were incorporated in the drive.

In those cases where a special engine was used to drive the supercharger, a flywheel was fitted thereto to reduce the torque irregularities.

A further disadvantage of the supercharger, when driven from the main engines as compared with the exhaust turbine-driven type was also encountered. In a turbo or centrifugal type compressor the rise in pressure is a function of the speed, and as it is the object of the supercharger to maintain constant engine speed, the turbo-compressor directly driven tends

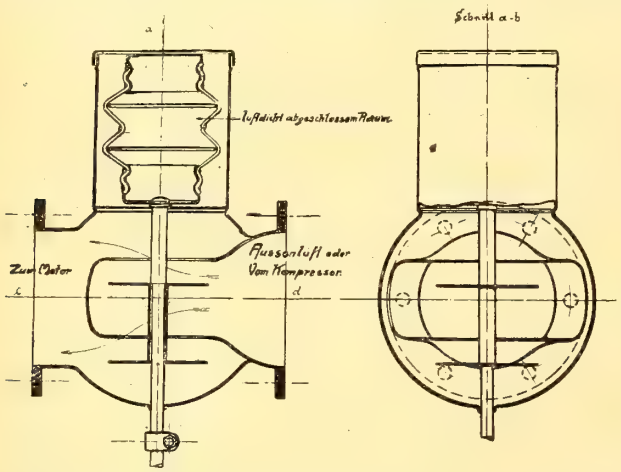


Diagram of the Lorenzen Automatic Control for Superchargers. A double beat throttle valve in the air circuit is controlled by the inverted aneroid arrangement shown.

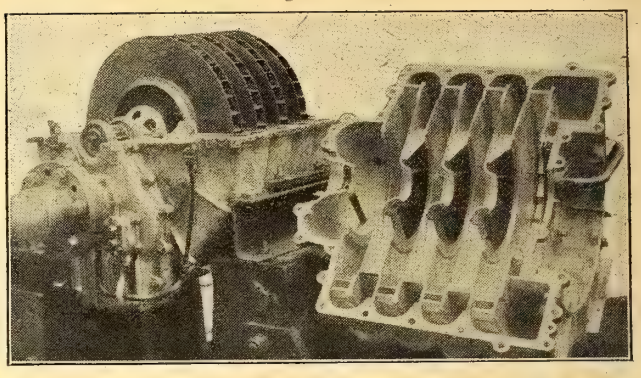
to supply an excess air pressure at low altitudes. This can only be overcome by either fitting relief valves to the inlet pipe system, or by throttling the air intake to the compressor.

Neither of these is an efficient method of regulation, as in both cases more work is done by the compressor than is necessary to supply air at constant pressure to the engine, and the exhaust turbine drive, when the compressor speed is regulated to give just the degree of supercharge required, presents a more efficient solution, more particularly as an element of automatic adjustment ensues from the decreased external atmospheric pressure in the exhaust side of the gas turbine, which occurs simultaneously with the need for a higher degree of supercharge.

With the separate engine drive on multiple-engine machines this trouble vanishes as the driving engine may be throttled to give the necessary speed. It may be expected, however, that this method of regulation will introduce increased risks of torsional vibration and gear troubles if any very wide range of speed is covered.

As has already been stated, all the German superchargers were of the multiple stage type, generally either three or four stages being necessary, according to the altitude to which normal inlet pressure was to be maintained. Apparently the centrifugal type was general, the rotors consisting of steel impeller blades mounted between high tensile steel discs, running on nickel chrome shafts carried on roller or ball bearings. The stationary parts consisted of an aluminium case, carrying the diffusor and deflector blades, and the stage partitions. The stationary diffusors and deflectors were commonly also of aluminium or duralumin, either integral with the case or built up from drawn sections and riveted in place, though steel was sometimes used for these parts. No indications are given of any novelties of a striking character in the general design, which very reasonably follows the practice evolved by experience in the construction of turbo-compressors for industrial purposes.

Rotor peripheral speeds seem to have been fairly uniform at 140 to 150 metres per second, corresponding to rotational



A Brown-Boveri Supercharger partly dismantled.

speeds varying from 11,000 r.p.m. in superchargers for single engines to 6,000 r.p.m. in the large types designed to serve multiple engines in giant aircraft.

The weights of the various supercharger designs do not appear to have varied greatly for similar purposes. Thus the Schwade type, designed to maintain constant pressure up to 3,500 metres for the 260 h.p. Mercédès, weighed 47.5 kilos.

A Brown-Boveri supercharger of similar capacity, designed for higher altitudes, weighed 54 kg., plus some 10 kg. of accessories, and consumed 28 to 30 h.p.

The A.E.G. supercharger for a similar engine, designed for constant pressure to 4,000 metres, weighed complete 56 kg., and similarly consumes about 10 per cent. of the engine output.

For central superchargers to deal with 1,200 h.p., the weight of a Brown-Boveri engine-driven supercharger is given as 145 kg., to which there is to be added the weight of the 120 h.p. Mercédès engine used to drive it.

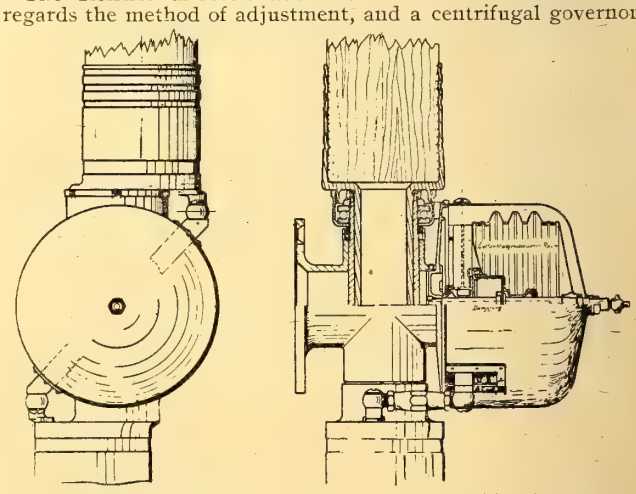
As in the case of Allied supercharging experiments, the work of developing variable pitch airscrews was a parallel necessity.

Certain efforts at the design of compromise airscrews, designed to operate best at roughly half-way between sea level and the maximum height of constant power, helped out by slight super-compression low down to allow the engine to turn at a reasonable speed when getting off, appear to have been made. This method allows for an increase of engine revolutions with height, and trouble ensued from the fact that bad vibration periods were encountered within the speed range needed.

A variable pitch airscrew of Dr. Reisner's design, built by the Helix Propeller Works, of Berlin, and by Hellmuth Hirth's experimental factory is stated to have proved reliable in practice.

No details of the essential features of its construction are revealed by Herr Noack, however.

The Reisner airscrew has been made in two forms as regards the method of adjustment, and a centrifugal governor



The Lorenzen air pressure controlled variable airscrew.

arrangement can be fitted to it to keep the engine speed constant.

Another variable pitch device is that due to Herr Lorenzen, who employs a barometric device, whereby a rubber diaphragm, subject on one side to a constant pressure of one atmosphere and on the other to the pressure of air around the machine, regulates the blade pitch.

It is stated also that the Garuda airscrew concern have experimented with a centrifugally-controlled variable pitch airscrew, but it seems reasonable to suppose that in Germany, as elsewhere, the practical difficulties of a construction combining strength with lightness have been the main difficulties in the way of successful airscrews of this type.

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THE CANADIAN AIR BOARD'S SPECIFICATIONS FOR EXPLORATORY AND FOREST PATROL AIRCRAFT.

As was briefly announced in last week's issue of The Aeroplane, the Air Board of Canada has issued specifications of certain types of aircraft and is inviting tenders for the manufacture and supply of machines to these specifications. In an explanatory letter signed by the Secretary of the Air Board, the following statement is made :—

"The Air Board has under consideration the purchase of a number of aeroplanes, seaplanes, and flying boats. As the war-type machines now in possession of the Canadian Government become obsolete, it is the intention of the Air Board to replace them with the most modern commercial machines available.

"A certain amount of experimental work must be done to determine the type and kind of aircraft most suitable for the commercial work undertaken in the peculiar conditions prevailing in Canada.

"The attached draft sets forth the requirements which the Technical Officers of the Air Board consider should be embodied in accepted types of aircraft.

"It is the policy of the Air Board to purchase one each of several types of aircraft and, after exhaustive tests in Canada, to standardise the types found to be most suitable and to order in quantities.

"You are therefore invited to tender for aircraft as per attached.

"Delivery of machines will be required on or before March 1st, 1920.

"A memorandum by the Superintendent of Flying Operations describing flying conditions and the operations contemplated is enclosed for information."

The memorandum referred to sets forth that aircraft will be used very extensively in the opening up and development of comparatively unexplored land. Development in Canada has extended east and west along the International frontier, and development north from that frontier has been small. There are thousands of square miles within a relatively short distance of the boundary between the United States and Canada unexplored and practically unmapped. It is for the exploration and development of these regions that aircraft are particularly needed by the Canadian Government. The work for which they will be mainly needed will be photographic exploration and forest protection.

The requirements for both types of work will be very similar. The country over which flights will be made is very rough and uncultivated, with aerodromes few and far between. Long distances will have to be traversed from the bases, and it is essential that the engine and installation be of the most reliable type possible, as a forced landing in a country devoid of roads or railways would mean total loss of the machine unless repairs can be effected on the spot by the crew.

The only months free from ice and snow in the northern parts of Canada are April to November. If flying is to take place all the year round, all types of aircraft must be able to land on snow and ice, and proper provision must be made for this fact in the design.

One even more difficult problem is introduced by the fact that for a certain period in the spring and the autumn it will be difficult to find either open water for seaplanes to land on or ice sufficiently strong to bear a machine at rest. A proper consideration of these points should be made in tendering to the specifications.

The Types Required.

The specifications issued call for four distinct types of aircraft—single-engined flying boats, single-engined aeroplanes, single-engined float seaplanes, and twin-engined aeroplanes.

In certain respects similar requirements are made for all four types. It is desired that the hull or fuselage of all types be considerably larger than is customary in war-time types, and that it be as free from internal cross-bracing as possible to provide a maximum stowage space.

Seating accommodation for pilot and three passengers is required in all types, and provision for landing on snow or ice must be made.

Ten hours' petrol capacity at cruising speed is required in each case, and dual control is to be fitted.

The Rolls-Royce Eagle VIII modified is specified as the power plant in every case, except in the case of the twin-engine aeroplane, when the choice is open as between "any standard type in production."

Provision is to be made for warming oil leads and water connections for winter flying, and a radiator system should provide for extremes of temperature ranging from 60 deg. below zero to 100 deg. Fahr. Machines must be so arranged that open types can be converted to cabin type to protect the crew in winter flying.

The largest possible cargo capacity consonant with the other requirements of the specifications is demanded.

A factor of safety of not less than 8 to 1 is required throughout.

The more specific requirements of the particular types are given hereafter.

1.—Single-engine Flying Boat.

The hull may be either "box" or "Linton Hope" construction, of diagonal planking, Consuta, or a combination of both, or of metal construction, designed to stand more wear and tear than those of war-type hulls. Hulls are to be provided with bulkheads and a drainage system, drained into a well provided with Kingston valve, or a self-baling cockpit. The hull to be as clear as possible for stowage.

The type will be used extensively on inland waters, and it is suggested that therefore a more efficient planing bottom than those of the war types can be designed. It is imperative that the boat take off with full load from fresh water at 3,000 ft. above sea level in a distance of 600 yards. Ailerons and rudder are to be balanced, the elevator may be so. Folding wings are desirable.

Petrol is to be fed from tanks in hull to gravity tank in top centre section by rotary pumps, and arrangements for rapidly filling main tanks from a central supply are needed.

Speed all out not less than 100 m.p.h. Rate of climb relatively unimportant, but first 2,000 ft. must be climbed rapidly. Ceiling fully loaded 14,000 ft. Landing speed, as low as possible.

Provision to be made for an aerial camera to operate through an opening in the hull. This opening to be closed by a screwed down deadlight.

2.—Single-engined Aeroplane.

Seats for three passengers to be removable to allow space for extra cargo. The undercarriage to be designed to provide great strength to meet rough landings on uneven ground, and must provide for landing on snow and ice.

The petrol system is to provide both pressure and gravity feeds to the carburetter. Main tank to be between engine and pilot.

Provision for as large a load of cargo as is compatible with the other requirements is necessary.

Speed not less than 120 m.p.h. Rate of climb, ceiling, and landing speed as in single-engine flying boat.

3.—Single-engine Float Seaplane.

Seating for three passengers and the maximum of free space for cargo in the fuselage is required. Floats of solid construction adequately drained and bulkheaded are called for. They must be arranged so that they do not interfere with the field of view of an aerial camera with 6 in. lens installed in the fuselage. Snow and ice landings must be provided for.

A tail float is optional, but a preference is expressed in the specification for long main floats and no tail float. Ailerons and rudders are to be balanced; the elevator is optional in this respect. Folding wings are desirable.

Petrol system combining gravity and pressure feeds, with rotary pump feed to gravity tank, the latter to be in the wings. Tanks to be rapidly fillable from a central supply.

Speed not less than 100 m.p.h. Climb, ceiling, and landing speed as in previous specifications.

Special stress is laid on the importance of designing for lasting qualities. The substitution of metal for wood, or any other means taken to prolong the life of aircraft and hence reduce depreciation, will be favourably regarded by the Air Board.

4.—Twin-engine Aeroplane.

General requirements exactly as in the single-engined machine. Only machines capable of flying in the air with full load and one engine completely cut out will be considered. Speed not less than 100 m.p.h. Climb, ceiling, and landing speed as before.

[It is very obvious that in the above specifications a very earnest effort has been made to leave the greatest possible scope to individual designers in regard to arrangement and construction. Nevertheless, it is feared that the performances specified will scarcely be reached in any of the single-engined types, as a rough computation of the weight of power plant, fuel and oil, crew and passengers, called for comes to very nearly 10 lb. per h.p. on the engine specified, without any allowance for the weight of the machine itself, or for any added cargo.

This leaves a very small margin for construction to reach a speed of 120 m.p.h. and a ceiling of 14,000 ft.—Ed.]

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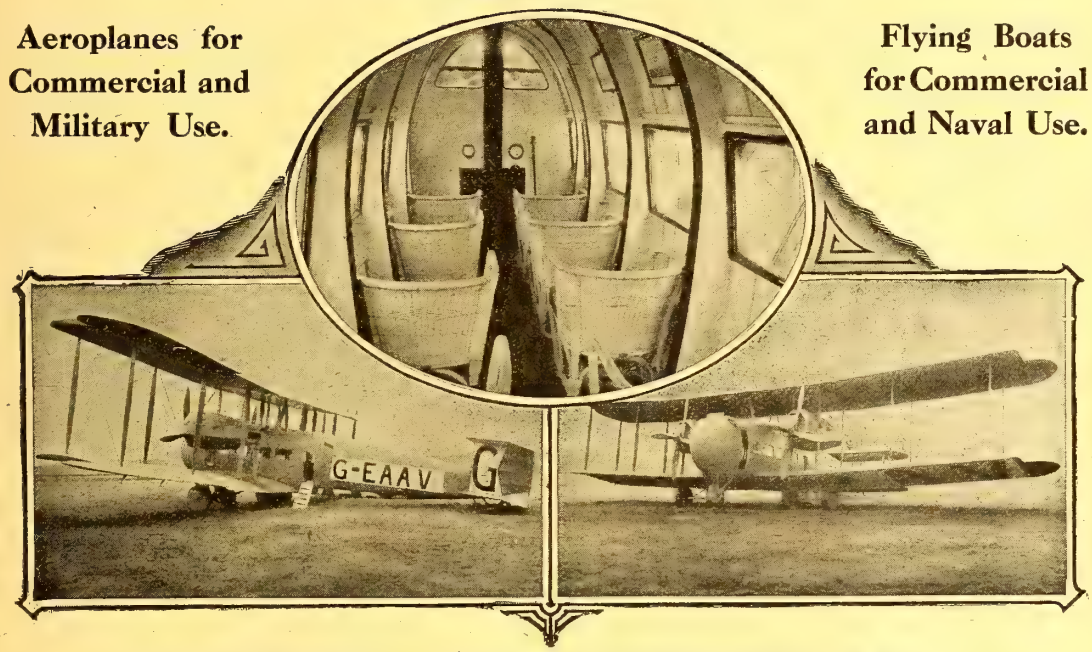

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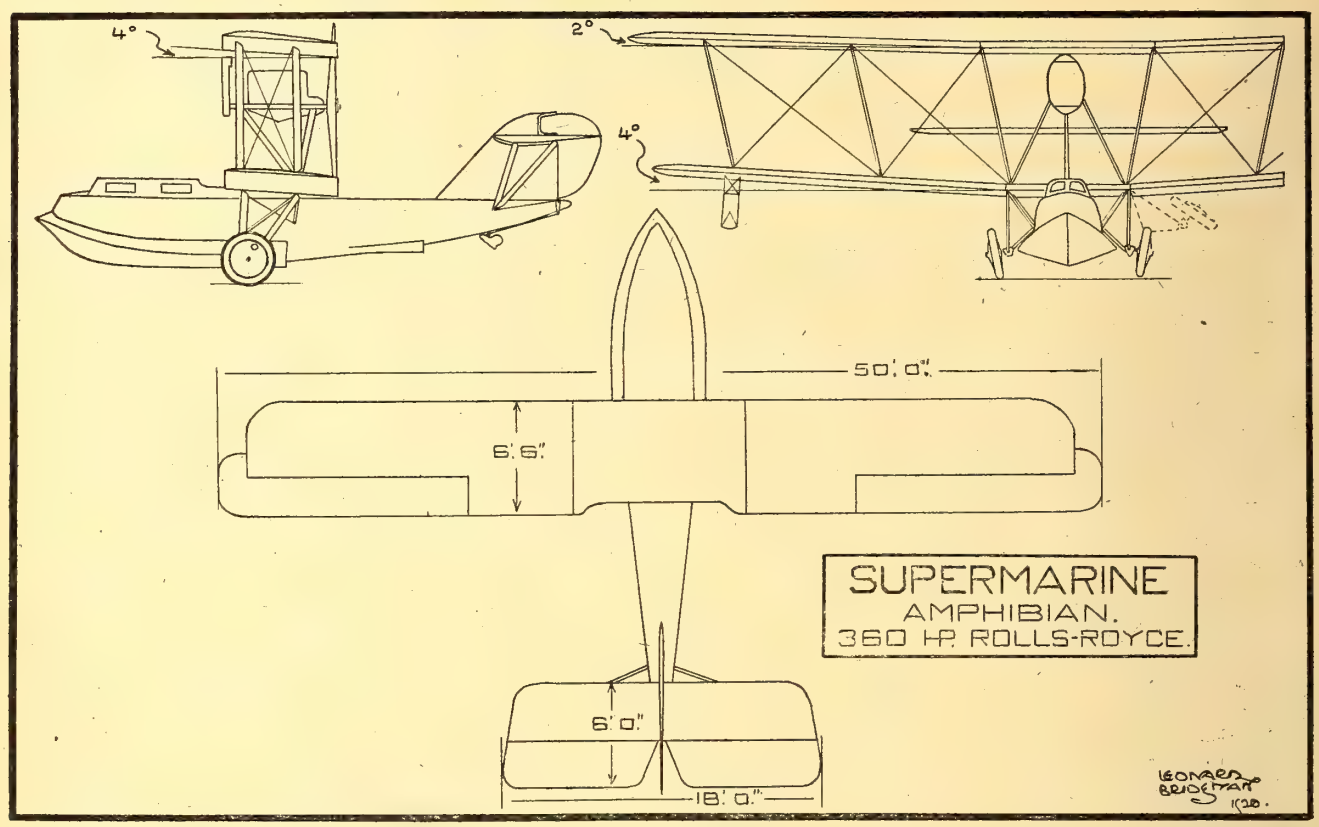
THE SUPERMARINE AMPHIBIAN.



The scale drawings reproduced above set forth the main dimensions and give the general arrangement of the Supermarine entry for the Air Ministry Competition for amphibian aeroplanes, which has now just terminated at Martlesham and Felixstowe.

Generally it will be seen to be a development of the well-known Channel-type craft. The hull is of the same general form and construction, but has apparently fins of considerably increased beam, giving a larger planing surface, and bows of a modified form. The fore end of this hull is occupied by tandem seats for two passengers, with a light glazed roof above. The pilot's *habitacle* is immediately behind this.

The wing arrangement is different to that of the Channel type, having a greater span on top than below, with outwardly raking interplane struts.

The undercarriage consists of two steel tube structures, triangular in end elevation, hinged below the bottom plane immediately below the inner pair of interplane struts. In working position this triangular structure fits snugly to the section of the hull and is anchored by a simple but positive catch to the hull at the junction between the inner body and the side fin. In their stowed position the wheels fold up under the lower wing.

The tail plane—unlike that of the Channel type—is a monoplane of the Supermarine inverted camber type, carried high on the fin by a tubular strut bracing.

Balanced ailerons and rudders are fitted. The elevator is of the usual unbalanced type.

A spring tail skid, orientable and coupled to the rudder controls, serves also as a water rudder; and a special tiller, accessible to the pilot when standing up, allows him to secure a clear view and to steer accurately in narrow or crowded waters.

OFFICIAL NOTICES.

AIR MINISTRY COMMUNIQUE No. 607 (CORRECTION).

The followilng corrections should be made in the Table of Data regarding large and small type aeroplanes competing in the Air Ministry Competitions at Martlesham Heath :—

1.—Handley Page W.8, "Speed in m.p.h., Cruising," "Indicated" should read 80 instead of 84. "Actual" should read 84 instead of 88.

2.—Austin "Kestrel" in column "Landing, yards from mark." The figure in this column should read 204, and not 244

[The Table referred to herein appeared in the issue of this Journal for Sept. 15th, page 520.—Ed.]

NOTICE TO GROUND ENGINEERS

No. 10 of the year 1920.

Foreign Matter in Petrol Systems.—It is hereby notified :—

Forced landings may be caused by the presence of foreign matter in the petrol systems, which is liable to choke the non-return valves, filters, etc., with consequent reduction in the supply of petrol to the engine.

Although petrol systems are designed to be proof against the entry of dirt and other impurities, it is nevertheless essential that the Ground Engineer should be careful to see that all precautions are taken to keep the petrol system clean.

The following preventative methods are suggested :—

(1) Clean out filters daily.
(2) Always use a chamois leather and fine-mesh gauze petrol funnel when filling tanks.
(3) Inspect non-return valves and pumps before flight.
(4) Check petrol flow daily to ensure that there is no stoppage in the pipe.
(5) Take particular care when fitting new tanks to ensure that they are prefectly clean.

Air Ministry, Sept. 23rd, 1920.

THE MACCHI M.15.—A machine designed and built by the well-known Italian builders of flying boats just too late to participate in the war. It was a two-seater driven by a 300-h.p. Fiat engine.

It carried as armament a synchronised gun for the pilot, one Lewis gun on a Scarff ring aft, and another Lewis gun firing aft below the fuselage. A speed of 200 km.p.h. and great manœuvrability are claimed

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AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

MORE GERMAN AND AUSTRIAN AIRCRAFT.

By ERIK HILDESHEIM.

COMMERCIAL AEROPLANES.

Threequarter side view of the Rumpler converted limousine. The likeness between the methods employed to disguise war aircraft as peaceful machines in Germany and in other countries is very obvious. In this example the added excrescence is more marked than in most cases.

THE RUMPLER LIMOUSINE.

Considering that they have been amongst the most active of the German aircraft firms in the development of civilian aerial transport, it is curious that the Rumpler firm have been so long in introducing an enclosed passenger machine.

Their first effort of this type only made its appearance some three or four months ago, and is known as the Rumpler Commercial Type 5a.

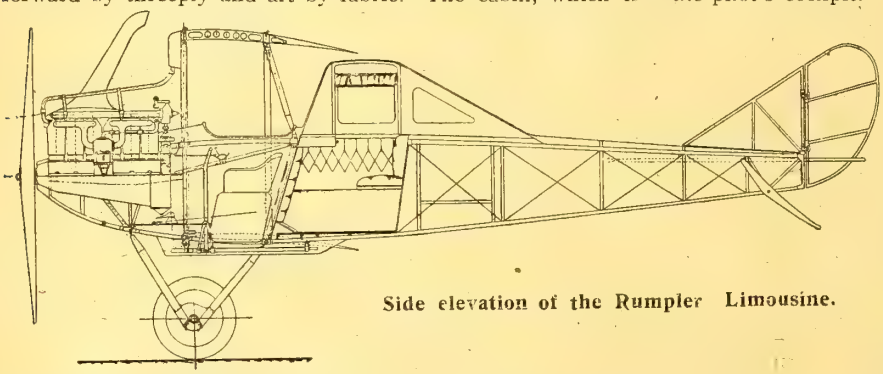
This machine is essentially of the war-time C.1 type, modified as to the fuselage.

The fuselage is built on four longerons, the front parts whereof are ash, the after parts of spruce, and is covered forward by threeply and aft by fabric. The cabin, which is really only an erection above the fuselage proper, is of threeply on bentwood formers, fitted with Triplex windows bedded in felt. One side and the top of this structure are hinged to open and a ladder is provided to give entrance and exit. The cabin is fitted with one cross-seat, amply wide for two passengers side by side, and is excellently upholstered, with polished mahogany woodwork and brass fittings. A speaking tube communicating with the pilot is fitted, and aft the cabin proper is a lock-up receptacle for luggage.

Both top and bottom wings are swept back, and both have a dihedral, the sweep back amounting to 2 deg. 40 min., and the dihedral to 1 deg. 20 min. The front spars are of steel tube, the rear spars of ash in both cases, and both wings taper in chord towards the tips. The top plane is of slightly greater chord than is the bottom, the difference, however, is only 10 mm. at the wing end. The incidence of the wings is washed out from 5¾ deg. at the roots to ½ deg. at the tips. There is a slight backward stagger of the top plane.

The planes are fitted with two rows of interplane struts a side, the length of the bays being 2.175 m. (inner) and 2.65 m. (outer).

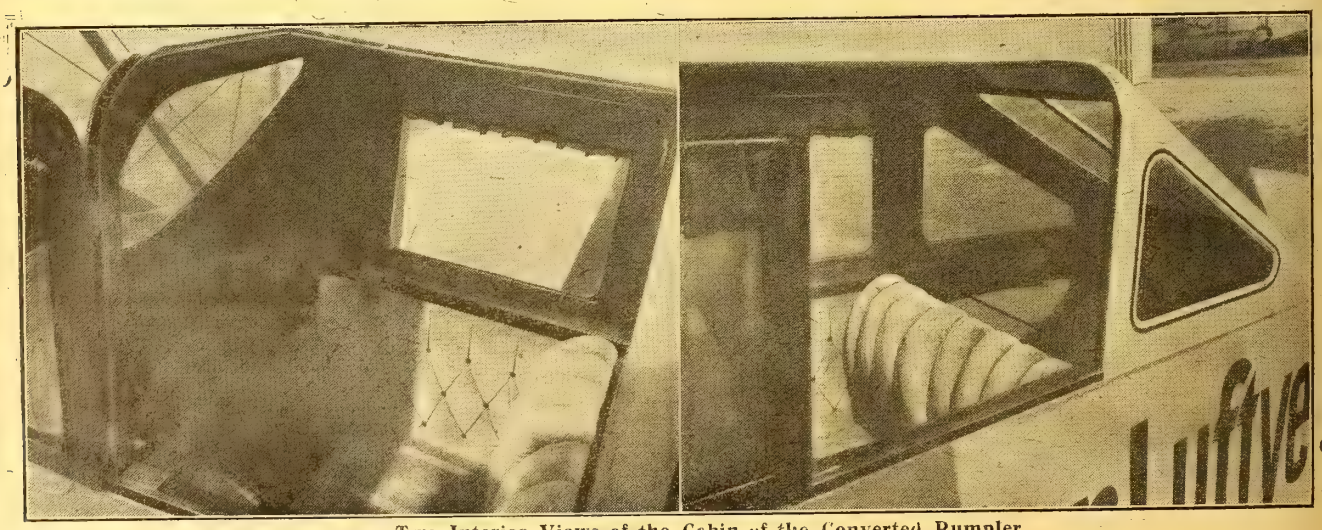
The main petrol tank—of 200 litres capacity—is below the pilot's seat, and is under pressure, and two auxiliary tanks, each of 75 litres, are fitted on the side of the fuselage by the pilot's cockpit.



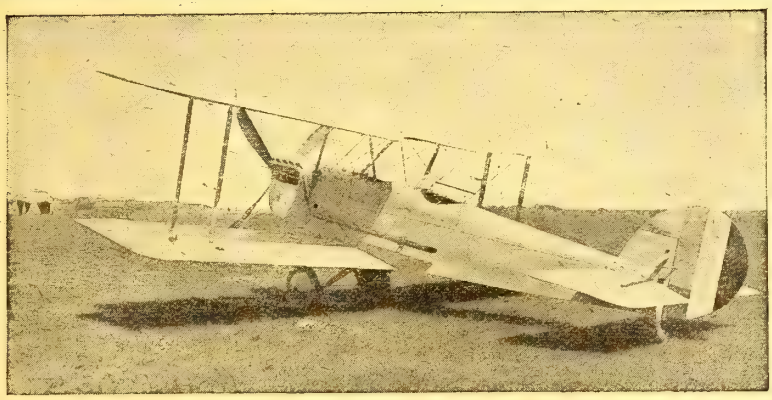
Side elevation of the Rumpler Limousine.

SPECIFICATION OF THE CONVERTED RUMPLER LIMOUSINE.

Type of machine	5 A.II.
Purpose for which intended	Passenger traffic
Span	12.15 m.
Gap	1.86 m.
Overall length	7.85 m.
Maximum height	3.06 m.
Chord	1.75 to 1.65 m.
Total surface of wings	35.7 sq. m.
Span of tail	3.56 m.
Total area of tail	5.67 sq. m.
Area of elevators	1.71 sq. m.
Area of fin	0.43 sq. m.
Area of rudder	0.63 sq. m.
Area of each aileron & total area	2.59 & 5.18 sq. m.
Max. cross section of body	0.9 sq. m.
Max. cross section of cabin	1.38 sq. m.
Horizontal area of body	4.7 sq. m.
Vertical area of body (limousine)	6.7 sq. m.
Vertical area of body without cabin	5.9 sq. m.
Engine type and h.p.	160 Mercédès D.III.
Airscrew, diameter, pitch & r.p.m.,	2.7-1.85-1.95 m. 1320
Weight of machine empty	805 kg.
Load per. sq. m.	37 kg.
Weight per h.p.	3.4 kg.
Tank cap. in hours.	6.5



Two Interior Views of the Cabin of the Converted Rumpler.



THE BOULTON & PAUL—P. 9.

An Aeroplane which is a Sound Commercial and Private Proposition

In this P. 9 Machine we have, we feel, solved the problem of providing an Aeroplane which is a sound business proposition—and which combines with low cost the great essentials for Commercial and Private use. All our great resources of material and craftsmanship have been utilised. Scientific Research and Experiment by a staff associated with flying from its beginnings coupled with the great Experience gained through the building of thousands of Aeroplanes during the War, have been concentrated in the production of this P. 9 Model.

It is a Two-Seater—Single Engine Tractor—which has attained on test a speed of over 100 miles per hour.

Its outstanding features are :—

CHEAP AND EASILY HOUSED. The Initial cost is extremely low ——— and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size it is easy to handle on the ground and requires but little accommodation. The principal dimensions are: Span, 27 ft. 6 in.; Length, 25 ft.; Height, 10 ft.

EASY TO FLY. The P. 9 has a big speed range, and low landing speeds, and this combined with Stability at all trimming speeds and well-balanced controls, allows the machine to be flown for long periods without undue fatigue. It also gives the maximum of Safety possible.

COMFORT AND CONVENIENCE. The comfort of the Pilot and Passenger has been specially considered. Each Cockpit is roomy and fitted with our special Seats. Controls for both Flying and Engine are fitted in the fron and rear Cockpits to enable the machine to be flown from either position. The exhaust from engine is discharged behind the rear Cockpit giving a silencing effect and freedom from fumes. Two standard cases are provided for luggage and form part of the fairing immediately behind the rear Cockpit.

The uses to which this compact and efficient machine can be put are wide and various, and will suggest themselves to those who have been awaiting the stage of Aeronautical Development now reached by the P. 9. It can be used for dozens of Commercial Purposes. The same type carried photos from R. 34 direct to London. It has been sent to Australia for Sheep-runs—and will soon be in use in various parts of the world for Exploring Uncharted Territory, Examining Timber Tracts, Fighting Forest Fires, Carrying Mails to Distant Mines, Transition of Colonial Mails to Mail Steamers, and for General Patrolling and Police Purposes.

If you are interested—write for full particulars. State your needs or purpose, and our engineers will consider every detail closely—to advise soundly.

Boulton & Paul Ltd.
NORWICH

LONDON OFFICE ADDRESS: 135-137, QUEEN VICTORIA STREET, E.C.4.

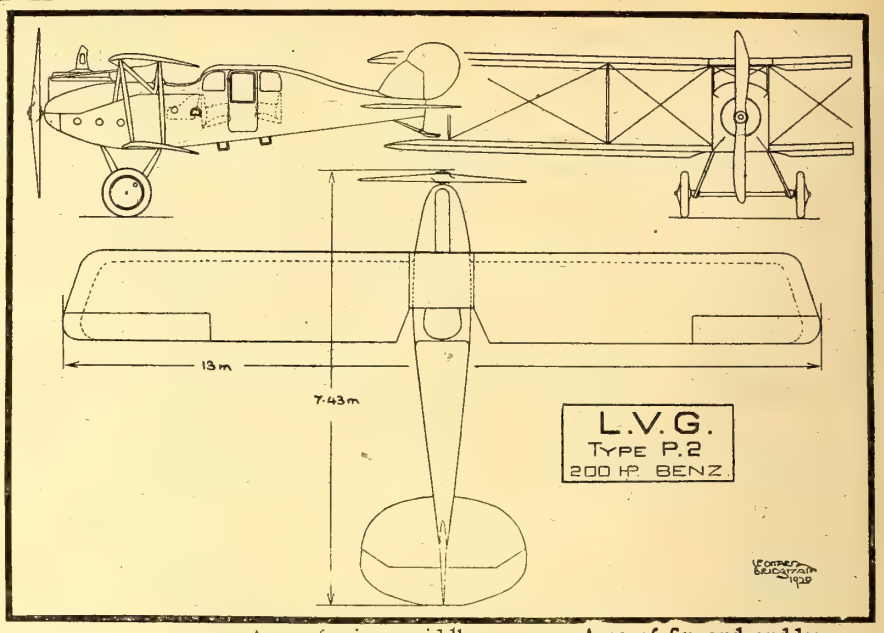
Tank capacity in litres 340

Performance—

Speed, low down .....160 k.p.h.
Speed at 1,000 m. .....140-150 k.p.h.
Speed at 2,000 m. .....130 k.p.h.
Speed at 3,000 m .....120 k.p.h.
Landing speed .....60-70 k.p.h.
Climbing speed .....32 k.p.h.
Climb to 1,000 m. .....10 min.
Climb to 2,000 m. .....22 min.
Climb to 3,000 m. .....40 min.
Ceiling .....4,500 m.

Disposable load apart from fuel 250 kg.

Total weight of machine loaded 1,350 kg.



AN L.V.G. LIMOUSINE.

The L.V.G. Company was the originator of the standard German tractor biplane, and during the war faithfully stuck to quantity production of their two-seater type, though it is known to have turned out at least experimental scouts and a triplane of the G class.

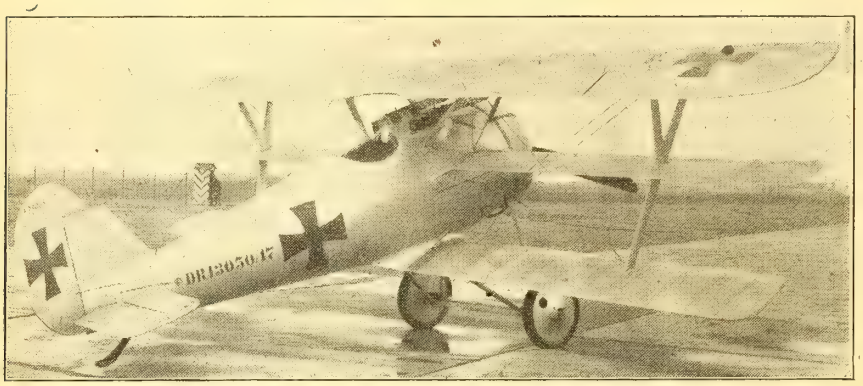
The only peace-time activity on record is the limousine shown, which follows the now conventional conversion of the rear cockpit to an enclosed passenger cabin with side entrance door aft and the open pilot seat.

Area of wing, middle 3.5 sq. m.
Area of wing, bottom 4.7 sq. m.
Area of tail 1.27 sq. m.
Area of fin and rudder 0.35 sq. m.
Area of each aileron 0.03 sq. m.
Incidence, top planes 4 deg. to 0 deg.
Incidence, middle planes 2.5 deg. to 2 deg.
Incidence, bottom planes .....3 deg.
Engine .....160-h.p. Siemens rotary

Weights—

Machine structure ..... 254.5 kg.
Power plant .....126 kg.
Gun and bomb fittings .....10 kg.
Pilot .....80 kg.
Two guns and ammunition ...47.6 kg.
Instruments .....11.4 kg.
Oxygen apparatus .....5 kg.
Oil and fuel (1½ hr.) .....38 kg.
Total load .....195 kg.
Total weight .....705 kg.
Wing loading .....41 kg. per sq. m.
Weight per h.p. .....5.2 kg.

SOME INTERESTING WAR TYPES.



A War-time Effort by the Pfalz Works to Produce a Triplane.

THE PFALZ TRIPLANE.

The Pfalz Aircraft Works at Speyer-on-Rhine, were incidentally the builders of the only aeroplane available on the German side in East Africa, a huge nacelled-pusher biplane. They were for the greater part of the war a close runner-up of the Fokker Company for Scout supplies, right away from the start of competition with a simple Morane monoplane copy against the Fokker model, with lengthened fuselage, and ultimately developed successful rotary and stationary-engined single-seater biplanes of their own.

During the German triplane period, which came to a rather abrupt end after Richthofen's death on the Fokker mount, the Pfalz works turned out with a similar mount, here illustrated. This certainly looks a cleaner job than the Fokker specimen. The Pfalz triplane may best be termed a triplane variant of the Nieuport wing arrangement, as the middle plane had only about half the chord of the top one, and the Vee-strut arrangement is here prolonged to a Y by the presence of a single interplane strut to the bottom wing. Only the single piece top plane was provided with ailerons. The neat streamlined body was the same as that of the contemporary biplane Scout, with the one exception, that the Siemens rotary engine was here totally enclosed, with holes for the intake and the exhaust gases, instead of leaving the cylinders uncovered in their lower positions as in the biplane.

Specification.

Name of machine Pfalz Dr.I.
Span, top .....8.55 m.
Span, middle .....8.1 m.
Span, bottom .....7.82 m.
Chord, top .....1.1 m.
Chord, middle .....0.5 m.
Chord, bottom .....0.7 m.
Gap, top .....0.78 m.
Gap, bottom .....0.73 m.
Length, overall .....5.5 m.
Height, overall .....2.76 m.
Area of wing, top ....9 sq. m.

GERMANIA AEROPLANES.

The Germania Aircraft Works is one of the very few aeroplane firms formed during the war which produced machines to its own design. They took over some of the sheds at Leipzig which—the Aviatik and D.F.W. Works also being situated there—ranks second only to Johannisthal amongst German aviation centres.

The Germania products appear from the C (two-seater) class machine illustrated to have been influenced by the clean design of fuselage, etc., of the D.F.W. concern. The lightened C class machine has, in addition, an I-strut arrangement and a distinctive radiator.

THE MISES TWIN ENGINED BIPLANE.

The only two efforts at building aircraft of large dimensions and capacity in the Austro-Hungarian Empire were one by Lloyd in Hungaria and one designed by Professor Mises, himself living in Germany. The latter is illustrated here and was built in the spring of 1916 to official orders.

The Mises aircraft is from its size and whole arrangement best characterised as an intermediate step between the German G and R. classes, and, like the Staaken biplane, is an enlargement of a conventional type. The wide fuselage is central between the planes and houses two 12-cylinder 300-h.p. Austro-Daimler engines. As they drive two tractor screws and two propellers through transmission shafts to outlayer girders at the inner struts each is no doubt fitted with 90 deg. bevel gearing. The planes with four bays of bracing have one separate centre section, and are cut out for the propellers and fitted with washed-out ailerons at the top only. The aft gunner cockpit, and a gun ring raised almost level with the trailing edge of the top planes to enable firing above them, will be noted.

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Telephone : 238 Gerrard.
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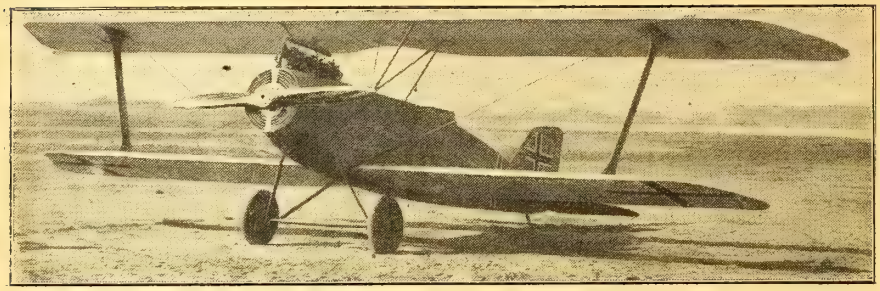
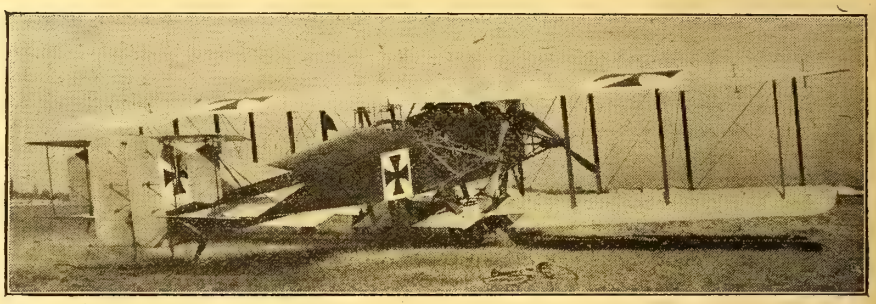
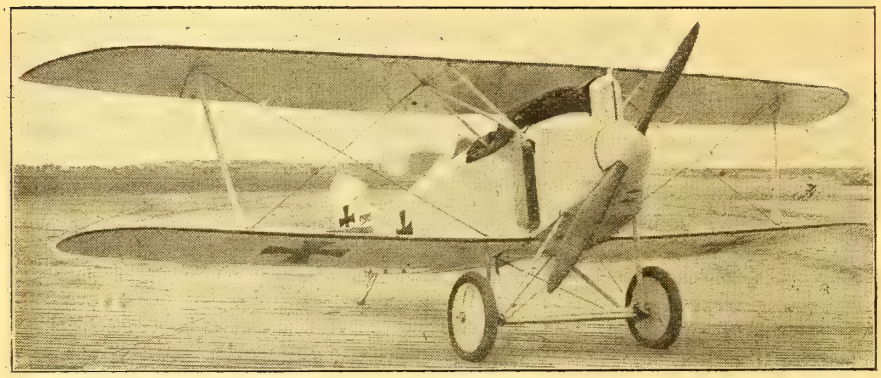


A Germania biplane of the Light C (two-seater) class. The extremely neat circular radiator is of interest—it appears to be constructed of flattened tubes bent into concentric rings, and would appear to introduce problems in water circulation.

The Mises twin-engined biplane with four gear-driven airscrews. One of the very few large machines of Austrian origin. Designed by a scientist of great repute, like many other examples of similar origin, it was a practical failure.





A single-seater built by Aug. Euler, to the designs of Lt. Hoehndorf, and under licence from the A.E.G. Company. One of the cleanest looking of German war aeroplanes.

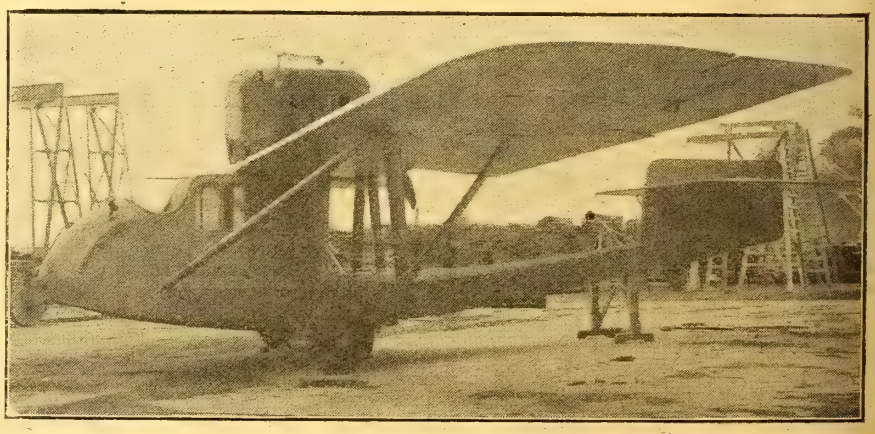
The tail is of curious form. Apparently there are twin fixed fins at each side of the fuselage, and a fixed tail plane in the usual position. Two separate balanced rudders are carried outside the fins from the tail plane, and the rudder posts support the top one of a pair of biplane elevators.

THE EULER MACHINES.

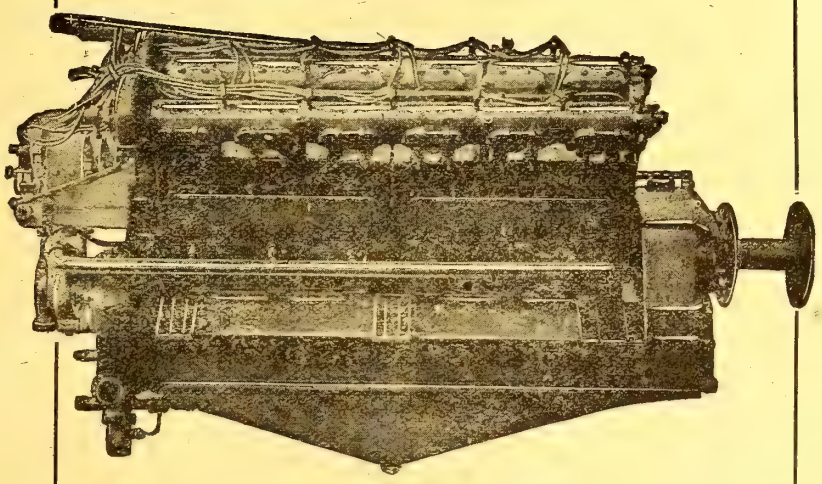
August Euler has always held a unique position in German aviation. Having earned a fortune as maker and won fame as rider and driver of cycles and motor-cars, he had the pluck to back his faith in aircraft, both financially at his Frankfurt factory and by personal pilotage. He took the first German certificate on a Voisin and then remodelled the type, on which Prince Henry then took his ticket and carried out a 50 km. flight.

During the war Euler dropped somewhat in the background as large engineering works of strong financial standing took the lead in the quantity production problem. The illustrated A.E.G. type scout built at the Euler works is evidence of his building under licence activities. As Euler since the Armistice has been appointed the first German Under Secretary of State for Air, one may assume that for the sake of impartiality Euler has now given up aeroplane manufacturing.

A passenger-carrying flying-boat, built by the L.F.G. (Roland) concern at their Stralsund works. It is obviously influenced by the Dornier giant monoplane in its main features, and like those machines is mainly built of duralumin. The power plant is one of the new 185-h.p. super-compressed Benz engines.



SUNBEAM-COATALEN ENGINES



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THE FIRST INTERNATIONAL AERO EXHIBITION, PRAGUE.

Mention has already been made in this journal respecting the First International Aero Exhibition, which is to be held under the auspices of the Czecho-Slovak Aero Club at Prague, from Oct. 23rd to Nov. 2nd, 1920. As copies of the rules and regulations have almost certainly been circulated to all firms and individuals likely to be interested in the exhibition it seems hardly necessary to go too deeply into them here, but for the sake of the interested few, other than possible exhibitors, a short précis is given hereafter.

The exhibition will comprise exhibits of flying machines of all kinds, aero engines, parts and material for the construction of aeroplanes and engines, all engines, apparatus, products, tools, etc., used in connection with aeroplane manufacture, etc. A special division is provided for firms unable to exhibit complete machines, where special facilities will be granted for the exhibition of posters, photographs, prospectuses, and models.

The last day for sending in applications for space was Sept. 25th, which applications must be accompanied by a fee of Kc.1,000 (Czecho-Slovak crowns). The charges for space are for non-members of the Czecho-Slovak Aero Club: aeroplanes, 60 Kc. per sq.m.; aero engines, etc., 100 Kc. per sq. m., with a minimum charge of 1,000 Kc.

For firms who are unable to show complete aeroplanes or engines, but are desirous of showing posters, photographs, models, etc., the price of one sq. metre of table or wall surface is 1,000 Kc.

It has already been stated that it is proposed to establish an international commercial aerodrome to act as a junction for all European air routes. A certain amount of stress has been laid on this fact by the daily Press, who, with a vivid imagination, have likened the future Prague aerodrome to an aerial Clapham Junction. Why this much-suffering jumble of permanent way, signals, and ill-tempered members of the N.U.R. has been selected for comparison is past a certain amount of comprehension. But it is obvious that a well-managed aerodrome, such as Prague is bound to be, under the jurisdiction of an efficient Civil Aerial Transport Organisation, opens up huge possibilities for trans-European air lines, when running powers such as are in existence on and over the various converging railway lines that centre on Clapham Junction will be ill-remembered dreams of the past. After all, only two main lines, and these South of England ones, pass this junction, the rest of the important North of England connections passing over the West London Joint Railway lines, which at the best are cramped and unable to bear more than a certain amount of traffic

With Prague as the centre of a circle whose radius is 600 miles, which covers most of the more important European countries and such centres of commerce as London, Paris, Marseilles, Rome, Warsaw, Riga, Stockholm, Copenhagen, etc., it does not require much foresight to see the possibilities of it as a future air centre.

It seems, therefore, of national importance that the British Aircraft Industry should be strongly represented at the Prague Exhibition. It has long been the policy of British manufacturers in general to make only that which is the best in the world, and thereafter to sit tight, full of pride, and wait for the other people to come and buy. Now, thanks to organised labour and healthy foreign competition, we are gradually seeing foreign products being used where ours used to be paramount. Commercial aviation is more or less a post-war "baby" and naturally some of our people, with their national pride, are apt to conclude that since we made the best aircraft during the war, we can do no worse in peace, and that everyone will, if they want the best, consult us first.

It is obvious that some foreign firms will realise the importance of exhibiting at Prague, and if the Czecho-Slovak or his neighbour, the Pole, want to buy aircraft they are certain to give the preference to firms who have the intelligence to send their products to their country so that they can see the "wheels go round" and admire the pretty insides.

With the Aviation Industry in this country in its present condition, it is obvious that many firms cannot afford to take much space at Prague, but surely so much "camaraderie" exists as might allow a number of firms to join forces in order to have a composite exhibit, or perhaps the S.B.A.C. could manage something on similar lines. It is all very well for firms to say that they cannot afford to spend money in building special aircraft for exhibition purposes, but, in the case of Czecho-Slovakia, if they purchase foreign aircraft from firms who have risked their all to make a bid for their future existence, and these said aircraft give every satisfaction, then it is fairly obvious that repeat orders will go to those firms who had the right foreign policy rather than to those who merely preyed with their good name. It is true that British aircraft have been seen in Prague, but, after all, those have only been out-of-date converted war machines. Our policy should not be to follow other nations, but to be first in the field with all things. Therefore, it is to be hoped that the British Industry will make some sort of a show at Prague, either with full-size machines or models, or both, or else to come to some amicable arrangement whereby a composite stand representing the cream of British Aircraft Constructors might arouse sufficient interest to give all who visit the exhibition "seriously to think"—L. B.

SHORT SERVICE COMMISSIONS.

A young friend of the writer's is applying for a Short Service Commission in the R.A.F. Before doing so he discussed the matter with his present employer and incidentally he remarked that the only anxiety he had was what he would do for a job at the end of his Short Service Commission if he failed to distinguish himself sufficiently to earn a Permanent Commission. His employer's remark was, "You won't need to worry about a job at the end of four years with the R.A.F.—all you'll want will be a wreath!"

The remark has its humorous side, albeit perhaps it is lacking in proper feeling. One's personal belief is that such Short Service officers as do not earn a permanent commission during their four years will be pretty sure to get a good job in civil aviation, seeing that by that time the boom in civil aviation should be well under weigh and these officers will leave the R.A.F. full of the latest technical knowledge concerning aviation, whereas those who drop out of aviation now will by then be nearly back numbers.

TRADE NOTES.

HANDLEY PAGE PROGRESS IN DESIGN.

Those who are concerned about the progress of aeroplane design in this country, and who are inclined to be perhaps a trifle pessimistic because nothing in the way of an epoch-making novelty was produced for the Air Ministry Competitions at Martlesham, will doubtless be interested to know that the Design Department of Handley Page, Limited, is at present hard at work on some new design work which is distinctly progressive.

One is not aware of the precise types of machines which are at present in hand in that department, but one gathers that the success of the Handley Page wing under test has resulted in a considerable amount of new design work being undertaken. Those who have lamented the dispersal of the designing staffs of various aircraft companies may feel consoled to know that here at any rate is one which is to-day very much occupied in new designs.

THE AIRCRAFT DISPOSAL COMPANY.

At any time anyone who is in any need of any article whatsoever should make a point of paying a visit to the premises of the Aircraft Disposal Company, Regent House, Kingsway. This is situated at the northern end of Kingsway and is quite near Holborn Tube station.

All sorts and conditions of furniture are on view for sale. Cylinder gongs and other similar articles such as were used to great advantage for the adornment of living quarters and messes in the Royal Flying Corps and Royal Naval Air Service and latterly in the Royal Air Force are to be seen.

There are still a considerable number of those excellent aircraft watches for sale, both new and "repair." The "repair" watches are almost as good as the new ones, the difference being that the "repair" type are those which had been fitted to aircraft, whether they had been used or not.

One is safe in saying that anything that anyone wants or at any rate the material with which to make this can be bought at Regent House.

Doubtless one can get a house built, furnished, and fitted complete with one's private hangar and aeroplane, the whole to be carried out and decorated by the Aircraft Disposal Company, Ltd.—G. D.

OF INTEREST TO PATENTEES.

An interesting handbook has just been issued by King's Patent Agency, Ltd., of 146a, Queen Victoria St., E.C.4, which contains some really useful information respecting patents, trade marks, designs, etc. This handbook must be regarded as distinct from those which, although purporting to be books of reference, are merely circulars, the useful information contained therein being limited to the scope of the particular person from whom it eminates, and is purely and simply an advertisement or schedule of fees. To anyone who is interested in or desirous of protecting any invention, trade mark, or design, against infringers, one can certainly recommend writing for this booklet.

MORTGAGES, CHARGES AND SATISFACTIONS.

British Anzani Engine Co., Ltd.—Satisfaction on Sept. 10th, 1920 (a) to the extent of £2,000 of debentures dated July 9th, 1920, securing £4,000 and (b) in full of debentures dated June 18th, 1915, securing £12,000. Particulars of £10,000 debentures authorised July 1st, 1920, also registered, whole amount issued and charged on the company's undertaking and property, present and future, including uncalled capital.

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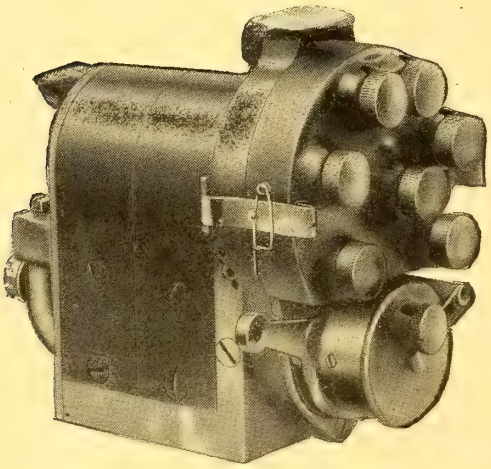

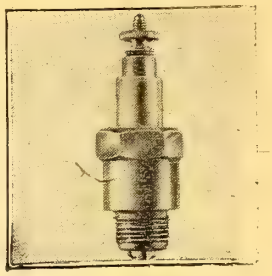

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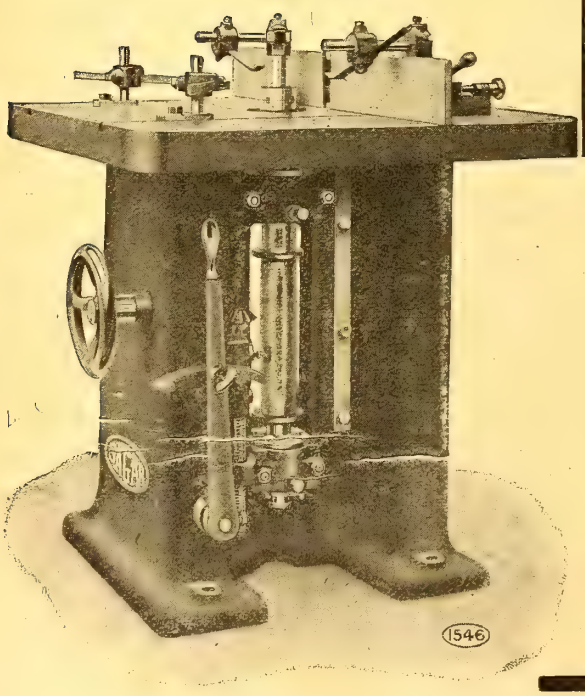

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BIRMINGHAM: Chamber of Commerce Buildings, New St.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

NOTICE TO AIRMEN (No 99 of the year 1920).

CROYDON AERODROME: AERIAL LIGHTHOUSE.

AIR MINISTRY, Sept 24th, 1920.

It is hereby notified: (1) An aerial lighthouse is established at Croydon Aerodrome which gives one flash every four seconds, thus:—

Flash—One second. Eclipse—Three seconds.

(2) It is in operation every night, from sunset to sunrise.

(3) Notice to Airmen No. 39 of April 14th, 1920, is hereby cancelled.

NOTICE TO AIRMEN (No. 100 of the year 1920).

GOVERNMENT AERODROMES: PRICES OF AVIATION SPIRIT AND OILS TO CIVIL PILOTS.

AIR MINISTRY, Sept 24th, 1920.

It is hereby notified: (1) The following prices for aviation spirit and lubricating oils issued at Government-owned aerodromes to civil pilots will be charged until further notice:—

Aviation petrol, 4s. 7½d. per gallon, exclusive of container. (If tins are taken away, 3s. per tin will be charged.)

Motor spirit, Grade 1, 4s. 3½d.; Grade 3, 4s. 1½d. (Prices in Scotland and Ireland, 1d. more in each case.)

Castrol R. lubricating oil, 10s. 3d.

Oil, mineral, thick, 4s. 8d.; thin, 4s. 8d.

Castor oil, pure pharmaceutical, 9s. 5d.; treated, 9s. 7d.

(2) No issue of aviation spirit will be made unless the Commanding Officer of the issuing unit is satisfied that the spirit is intended solely for flying purposes. Motor spirit will be issued only in cases of utmost emergency.

(3) Notice to Airmen No. 23 of March 8th, 1920, is hereby cancelled.

NOTICE TO AIRMEN (No. 101 of the year 1920).

LIZARD D.F. W/T STATION REOPENED.

AIR MINISTRY, Sept. 24th, 1920.

It is hereby notified: (1) The D.F. Wireless Station at the Lizard (Lat. 49 deg. 59 min. 07 sec. N., Long. 5 deg 12 min. 18 sec. W.) is again operating.

(2) Notice to Airmen No. 89 of Aug 24th, 1920, is hereby cancelled

(3) Authority:—Admiralty Notice to Mariners No. 1444 of Sept. 11th, 1920.

NOTICE TO AIRMEN (No 102 of the year 1920).

FRANCE: FLYING NEAR AIRSHIPS PROHIBITED.

AIR MINISTRY, Sept. 24th, 1920.

It is hereby notified: (1) Pilots are warned that, by a French decree of Aug. 26th, 1920, aircraft in France are prohibited from flying near airships in flight.

(2) The decree prescribes that no flying should take place within a minimum distance, in any direction, of 200 metres (approximately 220 yards) of such airship.

(3) Authority:—French Notice to Airmen No. 94 of 1920.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:— First comes the initials of the Air Line: next the type of machine: next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

(Compiled by the Staff of THE AEROPLANE.*)*

SEPTEMBER 20th:

A.T.&T., DH9, G-EAQA, London-Paris, 09.55-12.30, G.&M., 1, Lines.
A.T.&T., DH9, G-EAPL, London-Amsterdam, 10.15-13.15, G., Nil, Bamber
M.A., Breguet, F-CMAB, London-Paris, 13.21-16.10, Nil, Nil, Challoux.
A.T.&T., DH16, G-EASW, London-Paris, 15.45-18.00, G.&M., 3, Holmes.
A.T.&T., DH18, G-EAUF, Paris London, 10.10-12.30, G., 7, Armstrong.
C.desG.E.A., Goliath, F.GEAD, Paris-London, 11.30-14.05, G., 1, Labouchere.
C.T., Nieuport, F-CGTE, Paris-London, 12.40-15.05, M., Nil, Lecomte.
A.T.&T., DH9, G-EAQN, Amsterdam-London, 15.25-17.50, Nil, 1, Hinchliffe.
A.T.&T., DH9, G-EAPU, Amsterdam-London, 15.27-18.05, G.M., 2, Forson
A.T.&T., DH16, G-EALM, Paris-London, 15.55-18.07, G., 3, Robbins.

SEPTEMBER 21st:

A.P.B., Westland, G-EAJL, London-Paris, 13.35-15.27, G., 1, Powell.
A.T.&T., DH16, G-EAPT, London-Amsterdam, 14.10—, G., 2, Reeves.
A.T.&T., DH18, G-EAUF, London-Paris, 14.45-17.40, G.&M., 5, Forson.
A.T.&T., DH16, G-EALM, London-Paris, 15.55-18.35, G.&M., 3, Armstrong
A.T&T., DH9, G-EAGY, London-Paris, 15.57-18.35, G., 1, Carter.
A.T.&T., DH9, G-EAQL, Paris-London, 10.00-12.30, Nil, 1, Tebbitt.
A.T.&T., DH9, G-EAQA, Paris-London, 10.15-12.32, Nil, 2, Lines.
A.T.&T., DH16, G-EASW, Paris-London, 10.55-12.55, G., 2, Holmes.
M.A., Breguet, F-CMAB, Paris-London, 12.25-14.55, M., 3, Challow.
A.T.&T., DH9, G-EAPL, Amsterdam-London, 15.20-18.35, G.&M., 1, Bamber.

SEPTEMBER 22nd:

A.T.&T., DH9, G-EAPU, London-Amsterdam, 10.35-13.50, G., 1, Lines.
A.T.&T., DH9, G-EAQA, London-Paris, 10.55-13.50, G.&M., Nil, Milnes.
M.A., Breguet, F-CMAB, London-Paris, 14.15-17.05, Nil, 2, Challoux.
C.desG.E.A., Goliath, F-GEAD, London-Paris, 15.00—, G., 1, Labouchere
A.T.&T., DH16, G-EAQS, London-Paris, 15.40-17.55, M., 4, Robbins.
C.desG.E.A., Goliath, F-GEAB, Paris-London, 12.00-18.05, G., 8, Paten.
A.T.&T., DH18, G-EAUF, Paris London, 11.50-14.15, G., 6, Forson.
A.P.B., Westland, G-EAJL, Paris-London, 15.40-17.50, Nil, 2, Powell.
A.T.&T., DH16, G-EALM, Paris-London, 15.35-17.40, G., 2, Armstrong
A.T.&T., DH16, G-EAPT, Amsterdam-London, 15.35-18.05, G.&M., Nil, Reeves.

SEPTEMBER 23rd:

A.T.&T., DH18, G-EARO, London-Paris, 10.05-12.30, G.&M., 6, Forson.
A.T.&T., DH9, G-EAQN, London-Paris, 10.35-12.50, Nil, 2, Holmes.
A.T.&T., DH9, G-EAPL, London-Amsterdam, 11.47-13.32, G., Nil, Reeves.
I.A.L., Vimy, G-EASI, London-Paris, 13.05-15.50, G., 1, Chattaway.
A.T.&T., DH18, G-EAUF, London-Paris, 15.40-18.15, G.&M., 6, Armstrong.
A.T.&T., DH9, G-EAQL, London-Paris, 15.50-18.15, Nil, 1, Carter.
A.T.&T., DH9, G-EAQA, Paris-London, 10.12-12.45, Nil, 2, Milnes.
A.T.&T., DH9, G-EAGY, Paris-London. 10.15-12.40, Nil, 2, Carter.
A.T.&T., DH16, G-EAQS, Paris-London, 11.55-13.55, G., 3, Robbins.
M.A., Spad, F-CMAW, Paris-London, 12.30-14.30, G.&M., Nil, Bourdon.
A.T.&T., DH18, G-EARO, Paris-London, 16.10-18.25, G., 6, Forson.
A.T.&T., DH9, G-EAPU, Amsterdam-London, 16.30-18.45, G.&M., 2, Lines.

SEPTEMBER 24th:

A.T.&T., DH16, G-EALM, London-Paris, 09.45-12.15, G.&M., 3, Lines.
A.T.&T., DH16, G-EASW, London-Amsterdam, 10.15-14.25, G., 2, Robbins.
A.T.&T., DH9, G-EAQA, London-Amsterdam, 10.30-14.15, G, 1, Hinchliffe
A.P.B., Westland, G-EAJL, London-Paris, 10.31-13.05, Nil, Nil, Powell.
I.A.L., Vimy, G-EASI, Paris-London, 13.10-16.03, G., 4, Chattaway.
C.desG.E.A., Goliath, F-GEAC, Paris-London, 15.20-18.45, G., 5, Favreau
A.T.&T., DH9, G-EAPL, Amsterdam-London 15.30-18.00, G.&M., 2, Reeves.

SEPTEMBER 25th:

A.P.B., Westland, G-EAMV, London-Paris, 15.00-17.30, G., 3, Courtney.
A.T.&T., DH16, G-EALM, Paris-London, 12.10-17.05, G., 3, Holmes.
A.T.&T., DH9, G-EAQN, Paris-London, 12.12-17.10, Nil, 2, Lines.
M.A., Breguet, F-CMAF, Paris-London, 13.30-16.45, G.&M., Nil, Le Men.
A.T.&T., DH16, G-EASW, Amsterdam-London, 15.53-18.30, G.&M., 3, Robbins.
A.P.B., Westland, G-EAJL, Paris-London, 15.40-18.06, Nil, 3, Powell.

SEPTEMBER 26th:

C.desG.E.A., Goliath, F-GEAC, London-Paris, 08.40-1205, G., 2, Favreau
A.T.&T., DH9, G-EAPU, London-Paris, 09.30-13.00, Nil, 1, Lines.
A.T.&T., DH16, G-EAPT, London-Paris, 11.45-17.55, Nil, 4, Holmes.
A.T.&T., DH9, G-EAPL, London-Paris, 11.49-16.20, G., Nil, Bamber.
A.T.&T., DH18, G-EARO, London-Paris, 12.00-14.05, Nil, 7, Forson.
A.T.&T., DH16, G-EALM, London-Paris, 13.23-16.10, M., 3, Reeves.
A.T.&T., DH18, G-EARO, Paris-London, 15.45-18.10, Nil, 5, Forson.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

(Compiled from Log of Cricklewood Aerodrome. Times on the Continent from Air Ministry Communiqués.)

SEPTEMBER 20th:

H.P.T., D.H.4a, G-EAVL, Amsterdam-London, -11.55, M., 2, Foot.
H.P.T., DH9, G-EATA, London-Brussels, 14.42-17.05, G.&M., Nil, Moore.
H.P.T., HP, G-EATG, London-Paris, 14.50-19.50, G., 2, Jones & 1.
H.P.T., HP, G-EATM, Paris-London, 12.35-15.42, Nil, 8, Beal & 1.
H.P.T., HP, G-EASN, Paris-London, 12.40-15.58, G., 5, MacN. Davies & 1
H.P.T., DH4a, G-EAVL, London-Amsterdam, 16.25—, G.&M., 2, Foot.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 14.40-17.10, M., 2, Rigaud.

SEPTEMBER 21st:

H.P.T., HP, G-EATJ, London-Paris, 12.32-16.27, G., 9, McIntosh & 1.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 14.58-18.15, G.&M., 2, Rigaud
H.P.T., HP, G-EATG, Paris-London, 12.35-15.42, G., 7, Jones & 1.
H.P.T., DH9, G-EATA, Brussels-London, 14.50-17.15, G.&M., Nil, Moore.

SEPTEMBER 22nd:

H.P.T., HP, G-EALX, London-Paris, 12.15-14.45, G., 5, Bager & 1.
H.P.T., DH9, G-EAUN, London-Brussels, 15.52-17.15, G.&M., 1, Halliwell.
H.P.T., DH9, G-EATA, London-Amsterdam, 16.25—, G.&M., 2, Moore.
H.P.T., HP, G-EATJ, Paris-London, 12.55-16.07, G., 8, Rogers & 1.

SEPTEMBER 23rd:

H.P.T., HP, G-EATM, London-Paris, 12.37-15.50, G., 8, Jones & 1.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 14.50 (22nd)-13.05, G.&M., 1, Delzenne.
S.N.E.T.A., DH4, O-BARI, London-Brussels, 15.20-19.30, G.&M., 2, Delzenne.
H.P.T., DH9, G-EAUC, London-Amsterdam, 15.27—, G.&M., 1, Capps.
H.P.T., HP, G-EALX, Paris-London, 12.35-16.00, Nil, 4, Bager & 1.
H.P.T., DH4a, G-EAVL, Amsterdam-London,—16.63, M., Nil, Foot.
H.P.T., DH9, G-EAUN, Brussels-London, 14.30-16.28, M., 1, Halliwell.

SEPTEMBER 24th:

H.P.T., HP, G-EATK, London-Paris, 12.06-15.27, G., 10, Beal & 1.
H.P.T., DH9, G-EATA, Amsterdam-London, —12.17, M., Nil, Moore.
H.P.T., DH9, G-EAUC, Amsterdam-London, —13.23, Nil, Nil, Capps.
H.P.T., DH9, G-EATA, London-Brussels, 14.48-17.20, G.&M., 1, Rogers.
H.P.T., DH9, G-EAUN, London-Amsterdam, 14.48—, G.&M., 2, Olley.
H.P.T., HP, G-EATM, Paris-London, 12.50-16.53, G., 5, Jones & 1.

SEPTEMBER 25th:

H.P.T., HP, G-EALX, London-Paris, 12.20—, G., 5, McN. Davies & 1.
H.P.T., HP, G-EATJ, London-Paris, 12.36—, Nil, 5, Halliwell & 1.
H.P.T., DH9, G-EAUC, London-Amsterdam, 15.10-18.15, M., 2, Moore.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 15.12-18.10, Nil, 2, Foot.
H.P.T., DH9, G-EAUP, London-Brussels, 15.15-18.00, G.&M., 1, Hill.
H.P.T., DH9, G-EAUN, Amsterdam-London, 12.40-15.30, M., 1, Olley.
H.P.T., DH9, G-EATA, Brussels-London, 14.50-17.39, M., 2, Rogers.
H.P.T., HP, G-EATL, Paris-London, 12.35-16.20, Nil, 4, Hope & 3.

SEPTEMBER 26th:

H.P.T., HP, G-EATM, London-Paris, 12.10-15.40, Nil, 8, Capps & 1.
H.P.T., HP., G-EALX, Paris-London, 15.15 (25th)-16.10, Nil, 4, Beal & 1.

Inland Flying at Cricklewood.

Sept. 20th.—H.P.T., Handley Page 2 tests.
Sept. 21st.—Nil.
Sept. 23rd.—H.P.T., 2 Handley Pages, 3 tests; D.H.9 from Blackpool; D.H.9 test.
Sept. 23rd.—H.P.T., D.H.9 test.
Sept. 24th.—R.Ae.C. A-W. from Croydon
Sept. 25th.—H.P.T., H.P. test.
Sept. 26th.—Nil.

Inland Flying at Croydon.

Sept. 20th.—A.T. & T., D.H.9 test.
Sept. 21st.—Nil.
Sept. 22nd.—A.T. & T., D.H. 18 test.
Sept. 23rd.—A.T. & T., D.H.9, joyride. I.A.L., "Vimy" test.
Sept. 24th.—A.T. & T., D.H. 18, test.
Sept. 25th.—A.P.B., Westland test. I.A.L. "Vimy" to Northolt return.
Sept. 26th.—I.A.L., "Vimy," 3 joyrides.

The London Terminal Aerodrome

The Air Post of Banks are going well. A new machine (G-EAMV) has arrived. Several journeys on the Paris route were made during the week. One of the machines for the Royal Aero Club, an Ack-W, emerged from the Waddon depot during the week and was flown to Cricklewood.

The installation of the landing lights is going on well.

Towards the end of next week the Paris-London race for French commercial machines, for which this aerodrome is the London terminus, takes place.

The Cie. des Grandes Expresses Aeriennes having proved the superiority of their "Goliaths" over Mallaby-Deely suits and Pemberton-Billing houses in their Palais de Danse capacity, have now settled down as one of the most regular services in existence.—G. D.

A.T. and T. Notes.

The hard-working A.T. & T. pilots have been kept busy all the week on their usual service in spite of the filthy weather. The ordinary schedule machines ran to time, but, naturally, in the rain and mist with which this country was blessed during the week, people did not travel to the Continent by air or ground methods unless absolutely obliged.

A special D.H.18 was booked to Paris during the week, and Mr. Lines went to Zurich on a D.H.9.—G. D.

The Instone Air Line.

The "Vimy" made its scheduled return trips to Paris during the week with passengers and freight. On Saturday Mr. Barnard flew to Northolt to see how the "Bat" is progressing. This machine is now almost ready. It has had the engine from the D.H.4 installed and will be on the service during the week if all is well. Meanwhile, the old engine is about to be looked over by Rolls-Royce, during which time the D.H.4 will, of course, be out of action. Naturally, the four-seater will be a big asset to the firm, as she has been out of action since June 12th.

On Sunday Mr. Barnard was taking further *Evening News* photos from the "Vimy" of the district north-east of the Crystal Palace. He also carried a large number of joy-riders. The Northolt disaster did not affect the morale of intending passengers, which is a good sign.—G. D.

London-Glasgow Service.

The *Glasgow News* casts ridicule on a contemporary for stating that a Beardmore aeroplane had left for London recently. The *News* states that a machine did ascend, but only went for a "tootle."

However, the "tootle" seems to have been of a somewhat extended nature, because the machine, after a short stop at Brough, arrived at Croydon Aerodrome.—G. D.

Cricklewood.

The number of passengers on the Handley Page air lines has shown considerable increase recently. This is very satisfactory to all concerned. The notable event of the last fortnight was Mr. Vaughan Fowler's trip to Copenhagen. He covered the 500 odd miles in 5 hrs. 40 min.—G. D.

London-Bucharest.

The D.H.9 belonging to Handley Page, Ltd., which left London for Bucharest on Sept. 12th, arrived at Bucharest on the 16th. The actual flying time was 16 hours. Mr. Perry was the pilot. The machine was detained at Belgrade by the military authorities, but eventually was allowed to proceed.

Commercial Enterprise.

It is interesting to learn that William Dawson and Sons, of Cannon House, Breams Buildings, London, who are the largest Postal Subscription Agents in the world, are now regularly and successfully making use of the London-Amsterdam air service, thereby making a saving of 18 hours and over, on the old means of transit. Anybody interested in this enterprise, which incidentally is very much appreciated abroad, should communicate direct with Wm. Dawson and Sons at the above address.

The Berkshire Aviation Co.

The Berkshire Aviation Co. closed their Porthcawl aerodrome on August 14th, in order to begin a tour of the provinces.

Taunton was the first town on the list, and Capt. A. L. Robinson, with Messrs. J. D. V. Holmes and J. C. C. Taylor, piloted the machine from the Welsh resort.

Over 300 passengers were carried during the fortnight's stay, the youngest a baby girl of eight weeks, and the eldest an old lady of 79. Free flights were given to readers of the *Taunton Gazette*.

Frome (Somerset) was the next town to be visited, where over 100 passengers were carried in seven days. Great difficulty was experienced in this town in preventing the public from writing their names all over the machine.

The machine, a three-seater Avro, left Frome on Sept. 6th, piloted by Capt. Robinson, and covered the 100 miles to Banbury in 1 hour 20 minutes.

On arrival in this town it was found that another firm was flying from an adjoining field; it was, however, too late to cancel their programme, so the Berkshire Aviation Co. carried out passenger flights as arranged, and despite opposition, 80 passengers were taken up during the first two days.

The company are booked for Gloucester next week, and are flying in a field adjacent to the famous Fair Ground.

Capt. Wallace F. Hamilton has left the firm, forsaking aviation for the land, having purchased a small farm.

The tour is being run entirely by ex-R.F.C. officers. Lieut. J. D. V. Holmes, late of 19 Squadron, was a prisoner of war in Germany for two years. Lieut. J. C. C. Taylor, A.I.Ae.E., who was flying at Southport all last year, is carrying out the duties of Ground Engineer. Capt. A. L. Robinson, who is doing most of the flying, was instructing in the 6th Wing for a considerable period.

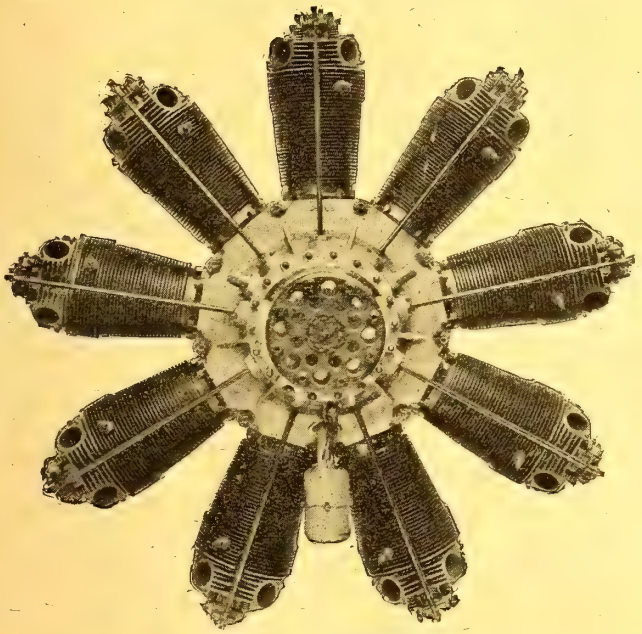
It is again the company's intention to tour throughout the winter months. It is their proud boast that they were the only firm to "carry on" with joy-flying during last winter.

Up to date over 16,000 passengers have been carried, and an approximate mileage of 80,000 has been covered with one machine. It would be interesting to know if this can be beaten.

THE

"Bristol"

400 h.p. JUPITER AERO ENGINE.



The Ungeared Jupiter Engine.

Ungeared type weighing 698 lbs.
Geared type weighing 805 lbs.

Important patents are incorporated in these types, and the reduction in weight per H.P. effected has never previously been attained in any other engine. Illustrated and descriptive details will be sent to those interested.

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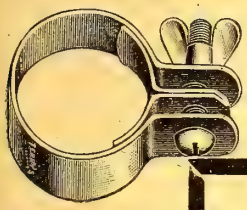

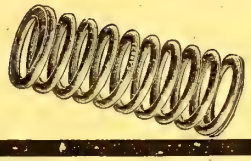

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Brooklands.

At a meeting of the Chertsey Rural Council held on Sept 22nd a member said that there was a report circulating in Byfleet that the Weybridge works of Vickers Ltd. would be closed at Christmas unless "something turned up." He pointed out that 132 houses had been built for their men by the firm, and if the works were closed these houses might be vacant.

Messrs. Vickers, per Mr. Dunbar, deny that there is any truth in the rumour. Mr. Dunbar informed local pressmen that "the firm was passing through a slack time, and that, although there would be fewer firms in aviation when the industry revived, Vickers would still be in the forefront. Aviation had a future, undoubtedly, but all aircraft works were now passing through a slack period, partly owing to the enormous surplus of machines throughout the world at the present time" (presumably aeroplanes designed and constructed specifically for purposes of war, and not for civil aviation). "These machines were gradually becoming obsolete, owing to the comparatively short life of present-day aircraft." (It is just possible that another reason for their being obsolete is that they are out of date in design, and of little use for peace time purposes, at least, few of them.) "There was every anticipation that next year there would be a conspicuous revival in aviation.

"Staffs have been reduced, and many of the Vickers cottages are not now occupied by employees of the firm. Owing to the housing difficulties many men, on leaving the firm's employ, retain occupation of the cottages erected by the firm."

Holstein Hall, Weybridge, which was taken over by Vickers Ltd. during the war and converted into an aeroplane shop, has ceased to be employed for the construction of fuselages and wings, as hitherto. Vickers have withdrawn all their employees from the building, having ample space for their aircraft work at their Brooklands factory, which was recently considerably enlarged. Like other aircraft firms, they are compelled to study and practise economy, and find it more economical to carry on their work under one roof.

At the time of writing Vickers Ltd. had not disposed of Holstein Hall, which was formerly used as a theatre, picture palace, or concert hall.—J. F. S.

Woking.
A Fire at the Martinsyde Works.

At approximately 13.58 hours on Saturday, Sept. 25th, a fire broke out in the fuselage department at the works of Martinsyde, Ltd., at Maybury Hill, Woking.

The employees had left the works and the only persons on the premises were the watchmen, who quickly warned the firm's own fire brigade and the Woking brigade. The Martinsyde brigade were soon pouring water on the planes, and the Woking brigade arrived five minutes after receiving the call. A large number of Martinsyde workers and others arrived and began to give assistance. By this time the fire was increasing in intensity, and had spread to the dope room and the machine and fitters' shops. Aeroplane wings, fuselages, and other parts were dragged out of the building into the road. Apropos of this, one was informed that a Woking resident was horrified to hear that "fifteen bodies were outside in the road," his horror only abating when it was explained that the word "bodies" was a common term for "fuselage"! Happily there was no loss of life, but several people were injured by glass falling from the roof.

Three large roof girders over the erecting shop fell down causing considerable damage, but luckily the vicinity was too warm to allow of anyone being underneath them. At one time it was thought that the flames might reach the petrol shed.

After the strenuous and heroic efforts of the firemen and helpers the fire was finally subdued after three hours' work, at the conclusion of which it was found that the fuselage department, dope shop, portions of the carpenters' and erecting shops, and the wood stores were destroyed. The machine and fitters' shops were also badly damaged. The fire has mainly affected the aircraft shops and departments, the motor-bicycle and other departments being practically untouched. Mr. F. C. Camplin, the secretary, estimated the damage at between £20,000 and £30,000, which is covered by insurance. 127 wings were completely destroyed, together with a few partially assembled "A" type machines and fuselages, tail planes, rudders, elevators, struts, etc.

The firm have decided that there shall be no unemployment owing to the fire, but are resolved to "carry on," although the employees are being put on half-time, with no work on Saturdays.

The cause of the outbreak has not yet been determined.

J. F. S.

THE BRITISH DOMINIONS BEYOND THE SEAS.

CANADA.
Surveys from the Air.

Operations carried out by the Canadian authorities in photographic surveys at Lake St. John have been progressing very favourably. In two weeks they have taken photographs which have given the Quebec Government a better idea of the territory north and east of Roberval than they ever had before. In similar work at Horley the first machine, a D.H.9a, crashed on landing, owing to the very rough state of the aerodromes, but two machines are now at work and are getting good results. At Vancouver things are not so far advanced, but it is hoped that flying will have started by the end of September.

Recently a request was received by the Air Board from the Department of Agriculture to send a machine to Lake Abitibi, which is situated on the border of Quebec and Ontario Provinces, halfway between Lake Huron and James Bay, to investigate an outbreak of spruce budworm which has been playing havoc in the Canadian forests. The Forestry people admitted that they could get more information from the air in a day as to the extent of the outbreak than they could in a season from the ground.

NEW ZEALAND.

The New Zealand correspondent of THE AEROPLANE wrote on Aug. 22nd :—

A Pioneer Flight.

The first air flight between Auckland and Wellington was completed on Aug. 19th, when a de Havilland 6, of 90 h.p., landed on the Hutt Park after first circling over the city of Wellington. The flight was commenced some little time ago, and the two-seater 'plane came down *via* Gisborne, Tokomaru Bay, Napier, Hastings, Dannevirke and Palmerston North. At each town of any size where a landing was made several days were spent in taking passengers for short flights. The usual fee charged has been five guineas. Bad weather has been encountered at many of the towns and on account of this the stops at several places have been unusually long.

The aeroplane belongs to Messrs. Walsh, Bros., of Auckland, and was piloted by Captain R. Russell, D.F.C., Croix de Guerre. Capt. Russell saw several years' service with the Flying Corps in France, and for some time was in charge of a flying squadron at Lille. He is a New Zealander.

The 'plane will remain in Wellington for some time, and in the meanwhile a large number of passenger flights are being made. Another 'plane—a three-seater—has been brought down from Auckland by train, and as soon as this has been assembled it will also take passengers up. When the writer found it necessary to send this report he had not been able to interview Captain Russell, but as soon as he can a detailed account of the journey will be forwarded.

Odds and Ends.

Captain Dickson, of the Canterbury Aviation Company, is making arrangements to carry out a flight from Christchurch to Wellington. As Christchurch is in the South Island it will be necessary for the aviator to cross Cook Strait. This flight should be made shortly.

The Government does not have very much to say about aviation in the Budget. It is mentioned, however, that it is expected at an early date to establish trial aerial mail services, which will be developed as facilities for the landing, housing, and repairing of machines are completed. The experiments carried out at Auckland have been sufficiently successful to warrant the Department launching out on a more elaborate scheme.

A proposal has been made to establish a company for the inauguration of a flying-boat service between Auckland, Gisborne and Napier, and to extend the service around the coasts of both the North and South Islands, should circumstances warrant. Mr. Charles Matthews has brought the matter forward. Mr. Matthews is chairman of the Cook County Council. He introduced Major S. E. Adams, who saw service with the Royal Air Force in France and Egypt, and Captain Seabrook, of Auckland. Major Adams proposed that a supermarine flying boat similar to that employed on passenger flying services at home should be used. He had inspected the various localities and felt assured that good landings could be made at the various towns. It would take about an hour to cover the distance between Napier and Gisborne, while it would take 2½ hours to reach the latter place from Auckland. Basing the freight on the present fares for taxis between the towns, Major Adams considers that the daily service should pay handsomely Apparently nothing further has been done in the matter.

In answer to a question in the House of Representatives, the Postmaster-General said that it was proposed to commence aerial mail services for two reasons. One of these was that men of the R.A.F. would be kept in training and would be always ready in any emergency.

The New Zealand Air Board has held several sittings, but beyond taking technical evidence from experts, nothing has been done.—H. B.

"AUTOCAR" CORRESPONDENT'S

6 MORE

M.P.G. from SHELL!

A correspondent, writing to the editor of *The Autocar*, Sept. 4, 1920, says: It would be interesting to know the opinion of other readers of *The Autocar* regarding two of the foremost brands of petrol at present on the market, as there appears to be a most remarkable difference in both miles per gallon, and pulling when one or the other spirit is used.

The one gives me, on an average, 17 m.p.g., sometimes only 15 m.p.g., with a far worse smelling exhaust than benzole. With the other (Shell) I have obtained as much as 23 m.p.g. with precisely the same carburetter setting, and the exhaust is quite different in smell.

As regards pulling, with the one if the engine is slightly carbonised, I get an atrocious "pinking" on hills, but none at all with Shell.

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THE AEROPLANE finds the stock of new books, such as "L'Aeronautique Pendant La Guerre Mondiale" and "The Aeroplane Handbook," pressing hard upon its available shelf and floor space It therefore proposes to give its readers the opportunity of relieving the congestion by an offer of certain surplus volumes at

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The most beautiful of War Books was Captain Saundby's **"Flying Colours."** Edition de luxe, £2 2s. Popular Edition, 15s. The copies remaining of the Popular Edition are now offered at **5s.** each, plus **6d.** postage. The book makes a handsome present, and could not be reproduced for double the money.

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THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

The Right Honourable A. H. Illingworth, M.P., Postmaster-General, will take the chair at Sir Frederick Sykes's paper on "Civil Aviation" on Thursday afternoon, Oct. 7th.

The paper on "Airship Piloting," on Thursday, Dec. 2nd, will be read by Major G. H. Scott, C.B.E., A.F.C.

AIR CONFERENCE.

The paper on "Technical Aspects of Service and Civil Aviation" at the Air Conference will be read on behalf of the Society by Captain F. S. Barnwell, Fellow, at 5 p.m. on the second day, Wednesday, Oct. 13th.

A very limited number of tickets for the Conference have been received from the Air Ministry, which are in the first instance being offered to Fellows of the Society. If any technical member desiring to take part in the discussion on any particular paper will apply to the Secretary, efforts will be made to arrange for a special ticket. Owing to the extremely limited accommodation which is understood to be available, it is feared that it will be impossible to obtain tickets for any members other than those intending to speak.

LIBRARY.

The following books have recently been received and placed in the Library: "The Medical Aspects of Flying" (Medical Research Council); "Meteorology," R. G. K. Lempfert.

The copy of the First Annual Report of the Society, 1866, which it was announced some weeks ago had been presented to the Society for disposal, has now been sold

JOURNAL.

The October issue of the Journal, which will be available on Oct. 1st, contains an original paper of great interest to engineers in general, as well as the aeronautical profession—particularly those using F.S.W. ropes in mining or other industries. It has been prepared by Mr. Walter Scoble as an account of his research work on wire ropes at the East London College. An important paper by Mr. Harris Booth on "The Design of Spars with Offset Pin-joints" is also included in the same issue.

SCOTTISH BRANCH.

The Autumn Lecture Session of the Scottish Branch will open in the second week in October with a lecture by Major-General Sir William Brancker, Member, on "The Most Recent Developments in Civil Flying," to be followed in the beginning of November by a paper by Air Commodore H. R. M. Brooke-Popham, chairman-elect. During November the second series of technical lectures to the engineering students of Glasgow University has been arranged. Major J. S. Buchanan, Associate Fellow, will lecture on "Aircraft," and Squadron Leader R. M. Hill, Associate Fellow, on "The Technique of Flight."

ARREARS OF SUBSCRIPTIONS.

It is desired to point out to members who are in arrears with subscriptions that their names will not appear in the new List of Members.

W. LOCKWOOD MARSH,
Secretary.

Sept. 25th, 1920.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Sept. 21st.

ROYAL AIR FORCE.—FLYING BRANCH.—Pilot Officer to be Flying Officer:—W. Anderson, Oct. 1st, 1919.

TECHNICAL BRANCH.—Pilot Officer A. H. Berry to be Flying Officer (Grade A), Oct. 1st, 1919.

MEMORANDA.—Pilot Officer T. J. O. O'Hara to be Flying Officer, Dec. 24th, 1919.

Hon. Wing Comdr. R. G. Millar relinquishes his temp. hon. R.A.F. commn. on ceasing to be empld., April 5th, 1919.

AIR MINISTRY, Sept. 24th.

ROYAL AIR FORCE.—SECONDING.—Lt. W. L. Payne, R.N., is granted a temp. commn. as Flying Officer (Hon. Flight Lt.) on seconding to the R.A.F. for three years, Sept. 14th.

FLYING BRANCH.—Flying Officer H. L. Rough, D.F.C., is restored to the Active List, March 3rd (substituted for notification in "Gazette" of Sept. 17th).

TECHNICAL BRANCH.—Flight Lt. (actg. Sqdn. Ldr.) G. Somers-Clarke, O.B.E., relinquishes the actg. rank of Sqdn. Ldr. on ceasing to be empld. as Sqdn. Ldr., May 17th.

MEMORANDUM.—Hon. Col. J. D. Cormack relinquishes his hon. R.A.F. commn. on ceasing to be empld., and is granted the hon. rank of Brig.-Gen., July 31st, 1919.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

ENGAGEMENTS.

SANSOM—DODGSON.—The engagement is announced between George Samuel Sansom, B.Sc., M.C., D.F.C., only son of the late Samuel George Claydon Sansom and Mrs. Sansom, of Ravenswood, Horsted Keynes, and Dorothy Vivien, youngest daughter of the Rev. Francis Vivian Dodgson, M.A., and Mrs. Dodgson, of Sunny Cliff, Mortehoe, N. Devon, and granddaughter of the late General Sir David Scott Dodgson, K.C.B.

STYRAN—MITFORD.—The engagement is announced of Miss Violet Mitford, third daughter of R. Osbaldeston-Mitford, of Mitford Castle, Northumberland, to Lieut. A. J. Styran, R.A.F.

EMPLOYMENT.

[Except where addresses are given, communications should be sent c/o THE AEROPLANE, 175, Piccadilly, W.1.]

Ex-officer, R.A.F. (Sec. Lt., Admin. Stores), aged 26, Public School, keen motorist, musical, good social standing, highest references, seeks position as companion-secretary or similar post.—A. H. R. G.

COMING EVENTS.

SEPTEMBER.

Last week.—Latvian Trade Fair, Riga, opens.

OCTOBER.

2nd, Sat.—Gordon Bennett Cup Meeting at Etampes closes
7th, Thurs.—R.Ae.S. lecture. "Civil Aviation," by Major-Gen Sir F. H. Sykes, G.B.E.*
8th, Fri., 9th, Sat., 10th, Sun.—French Aviation Meeting at Buc.
Tues., 12th, Wed., 13th, Thurs., 14th.—Air Ministry Air Conference in London.
16th, Sat.—No. 4 Squadron Dinner at 8 p.m. at Savoy. Particulars from Lt.-Col. Carthew, 2, Mitre Court Buildings, Temple, E.C.4.
21st, Thurs.—R.Ae.S. lecture. "A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Sqdn. Ldr. R. M. Hill, R.A.F.*
23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.
International Aero Exhibition, Prague, opens.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes
2nd, Tues.—International Aero Exhibition, Prague, closes.
4th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*
18th, Thurs.—R.Ae.S. lecture. "The Design of Aeroplane Control Surfaces, with Special Reference to Balancing," by H. B. Irving, "Airscrews," by A. Fage.*

DECEMBER.

2nd, Thurs.—R.Ae.S. lecture. "Airship Mooring," and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.*
16th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Instalment of Aeroplane Engines," by A. T. Rowledge.*

JANUARY—1921.

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr. H. W. S. Outram.*
17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

MARCH—1921.

3rd, Thurs.—R.Ae.S. lecture. "Airship Fabric," by J. W. W. Dyer. "Parachutes," by Major T. Orde Lees.*
17th, Thurs.—R.Ae.S. lecture "Flying-Boat Construction," by Capt. D. Nicolson.*

Dates to be announced:—
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* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30.

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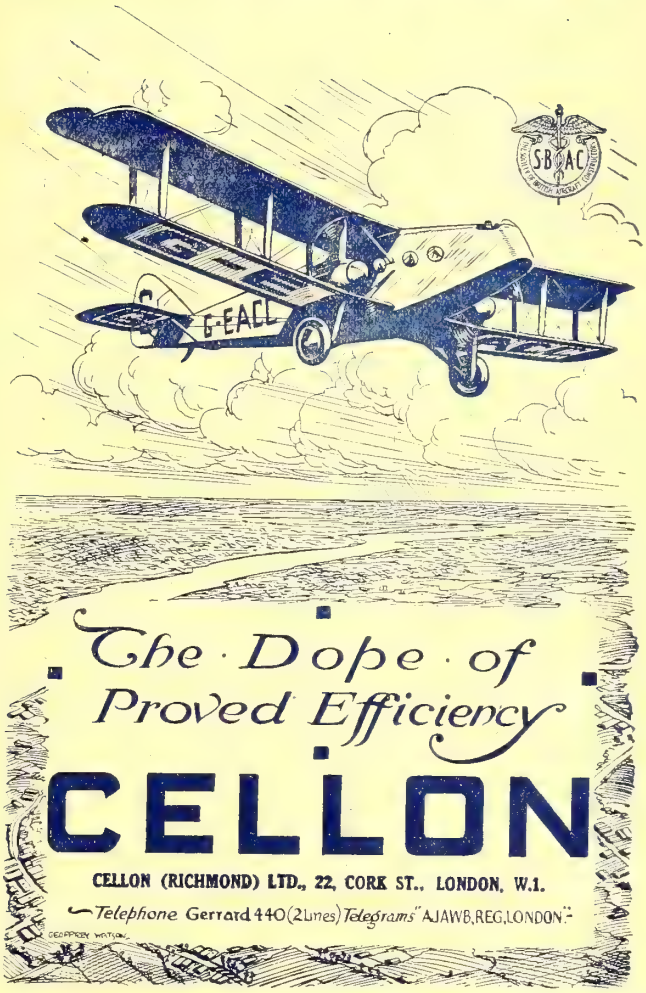

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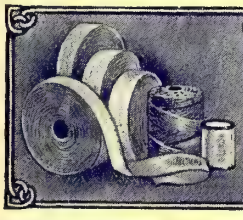

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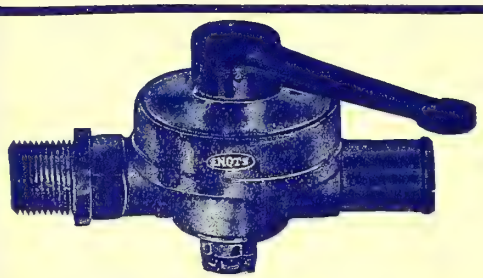

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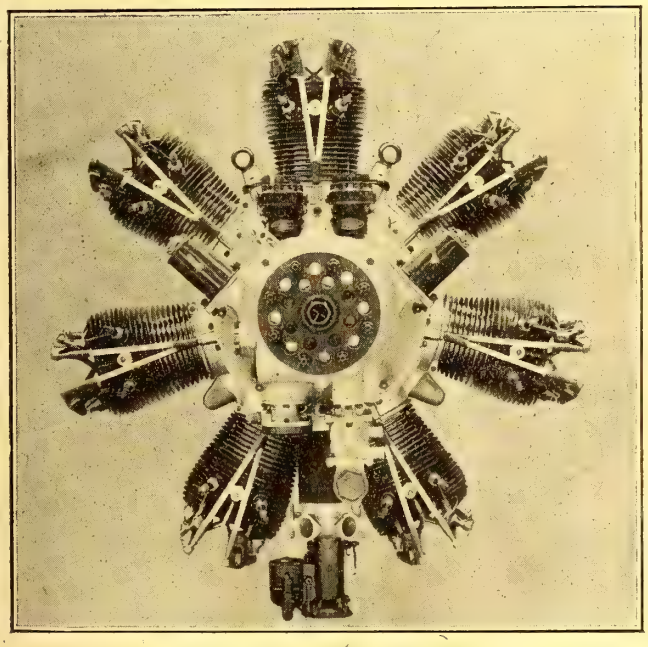

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ON THE LAST GORDON BENNETT RACE.

SEPTEMBER 28th, 1920.

Sometimes it seems rather a pity that the Germans did not win the war. If they had done so either they would have taught us to be thoroughly efficient in aeronautical affairs, or else they would have made aviation *verboten* and so would have prevented us from making the quantity-production of aviatic fiascos one of our leading national industries.

In the latter case there would have been no Schneider Cup fiasco at Bournemouth a year ago: there would have been no Monaco Meeting, so it would not have mattered about there being no British entries: there would have been no Olympia Aero Show, so it would not have mattered whether we chose to hold it at the wrong time of year or not: there would have been no Schneider Cup Race in Italy, so the absence of British competitors would not have been obvious: there would have been no Gordon Bennett Race in France, so nobody would have known whether we could put one representative into the air or three, or whether all or none of our representatives could have stayed the course: and there would have been no Guildhall Conference to endeavour to boost aviation just when industrial and climatic and financial conditions were most unfavourable to artificial respiration, or restoration.

Then we could all have sat back and told one another what fine fellows we were, and what we *would* have done on all these occasions if we had not been stopped by the tyrannical Hun. And all our gallant war-profiteers would have told us what they would have done for Civil Aviation, and what a fine thing they would have made of the Aircraft Industry if it had not been *verboten*.

As things are it is a trifle difficult to find excuses for ourselves. So let us put it all down to Industrial Unrest and the Excess Profits Duty. Let us blame Labour and the Government. But, for Heaven's sake, do not let us blame ourselves.

So far as the Gordon Bennett Race is concerned, we have at any rate the consolation that if our one representative did not stay the course, neither did two out of the three French competitors, nor did any of the three Americans. And if the Latin Race wants to congratulate itself let it reflect on the cheering fact that the winner bore the essentially French name of Sadi-Lecointe, and that the Comte de Romanet did at any rate complete the distance, even though he had to land on the way. Whereas the competitors who failed to go through at all were named Kirch, Rohlfs, Rhinehart, Schroeder, and Raynham—all of distinctly, if remote, Teutonic origin. So perhaps, after all, if the Germans had won the war we might not have gained very much. At any rate, the luck of the Teutonic Race was dead out.

With which few kind words by way of congratulation to our friends in France, let us proceed to discuss in detail the Gordon Bennett Race which was flown from the Ville-Sauvage Aerodrome at Etampes on Tuesday, September 28th.

THE TEAMS.

The Nieuports and their Pilots.

The French team consisted of M. Sadi-Lecointe and M. Kirch on Nieuports and the Comte de Romanet on a Spad, all with 300 h.p. Hispano-Suiza engines. The Nieuports were identical with one another, except that Sadi-Lecointe's had double lift-wires, whereas Kirch's had single wires. Both machines were exactly like the speed and altitude record-breaking machines shown at the Exposition in the Grand Palais last Christmas. In fact, so far as one could discover, they were the same machines painted white instead of black. Both had Lamblin radiators.

M. Sadi-Lecointe, who was a famous pilot before the war, is now recognised as being perhaps the finest pilot in the world, and is certainly the equal in skill of anybody who has ever flown or is ever likely to fly. There is nothing about him to suggest the "gallant bird-man," for he is short and thick-set, with a round face and the general air of a successful business man. It is only when one watches him closely that one appreciates the keen mind behind his apparently placid exterior. Sadi-Lecointe is distinctly one of those who flies with his head and not merely with his hands.

M. Kirch, though a pilot of experience, was little known even to the French aeronautical community until he revealed himself in the Eliminatory Tests, held on the Saturday to select the French team, as a pilot of the first class. His handling of his machine on the day of the Gordon Bennett Race, both in starting and landing, showed that he is very skilful indeed, for these small projectiles are no mount for the heavy-handed. He himself is a small thin man, very quiet, and much more of the physiognomy of the typical aviator than his stable-companion.

The Spad.

M. de Romanet's Spad is a new product of M. Herbemont's fertile brain, and a very taking little machine it is. M. Herbemont said before the race that it was not *au point*. Certainly, the power plant was not, but there seemed to be very little the matter with the aeroplane, which behaved beautifully, both on the ground and off, though certainly M. de Romanet's skilful piloting always makes a machine show to the best advantage.

As may be seen from the photographs, M. Herbemont has come to the conclusion that a fuselage which fills the whole gap between the planes is the fastest; in which he agrees with the late Mr. José Weiss, and several German designers, and Mr. Fritz Koolhoven. In this machine he has fixed his planes direct to the top and bottom of the fuselage and has put the pilot on top of the fuselage just behind the upper plane, where he has an excellent view all round above the planes, and downwards on each side, and behind, but no view forwards and downwards; which, after all, hardly matters in a racing machine.

Though one is inclined to wonder how the pilot would fare if the machine turned over in landing, the machine is very taking, and, like all M. Herbemont's products, it is very well made in detail. If the engine had behaved itself it would certainly have put up a very fine show. Incidentally, it was the only machine with a Lumière airscrew. Like the Nieuports, it had a 300 h.p. Hispano-Suiza engine, but it had a nose-radiator instead of a Lamblin.

Of M. de Romanet himself it suffices to say that not only is he one of the most skilful pilots in France—he would never have been able to land as he did without crashing if he had been anything less—but he is personally one of the best fellows in the world. He is deservedly one of the most popular, and at the same time one of the least self-important people in French aviation. He combines all the charm of manner of the old *noblesse* with the cheeriness of the modern young sportsman. One hopes that ere long it will be his good fortune to win one of the great aeroplane competitions, for none has tried harder or deserved better to do so.

The American Team.

The aviation people of the United States certainly deserve full marks for their enterprise in sending a full team so far

for a purely sporting event. The pity is that, as is so often the case with American efforts in various activities, they assumed that what seemed right on paper would be right in practice.

Their machines repeated more or less the history of the Liberty engine. They were designed and built in a hurry. They were full of clever ideas. And they will all be very good in time, with sundry necessary alterations. But they were not properly "tried out"—to use the expressive Americanism—before being sent over to this effete Continent.

The Dayton-Wright.

The Dayton-Wright is a really excellent scheme, and is a perfectly wonderful piece of work. The engine is a 260 h.p. Hall-Scott, which calls for no special notice. It is just a good plain engine. The aeroplane itself is a cantilever monoplane built of plywood, painted with aluminium, and polished and varnished till it is hard to convince oneself that it is not actually built of sheet aluminium. The outstanding novelties about it are the retractable undercarriage and the variable camber wings. One cannot describe the undercarriage without elaborate drawings and diagrams, so it must suffice to say that by turning a crank inside the cabin the whole undercarriage is drawn up inside the fuselage till the wheels fit up into the holes in the sides, which may be seen in the photographs. When in place the wheels conform to the outline of the fuselage so that wind-tunnel tests on models fail to show any difference in head-resistance between a clean fuselage without wheels and one with the wheels drawn up into place. At the same time the wheels are very well sprung and operate very satisfactorily in landing. The only drawback seems to be that it takes at least 15 seconds to pull up the wheels or let them down.

The wing arrangement is also very interesting. Both the leading and trailing edges can be moved up or down by means of a crank in the cabin. Thus the wing can be made heavily cambered for getting off or landing, or flattened for high speeds. The trailing edge also acts as the aileron on each wing, whether wound down or up. The push-and-pull rods and levers which operate this variable camber may be seen in the photographs. These excrescences being on the top of the plane suggest that they may decrease its efficiency, and one is inclined to think that they would do less harm if placed under the wing instead of on top of it, though one understands that they have been tried underneath and that there is some mechanical difficulty about putting them there. At any rate this variable camber cantilever wing is an effort in the right direction and it is to be hoped that it will be developed by further experiments.

The worst feature about the machine is the position of the pilot, who sits right inside the fuselage, and has no view ahead, above, or below, and so is compelled to navigate by what he can see diagonally ahead. As the cross-section of the fuselage is small the pilot has even less view than had the pilot in the Alliance biplane which once flew from London to Madrid. There the pilot had good big windows through which to see the landscape, but in the Dayton-Wright he has very small windows and his angle of view is worse than in the Alliance because he is close up to the bulkhead in front.

The idea of putting the pilot right inside is apparently to combine speed with comfort, but it does not seem worth while to buy comfort at the price of safety, for such an arrangement is distinctly dangerous, in that the pilot cannot see other machines approaching and so is in imminent danger of collision unless he has the whole atmosphere to himself. The scheme has, however, much to recommend it for big passenger-carrying machines, in which all the passengers would be inside and the pilot would sit on top level with the leading edge of the wings.

Rhinehart and Co.

The Dayton-Wright pilot, Mr. Rhinehart, and his crew are of that quiet earnest type of American which many of us met for the first time during the war. They did little talking and much work, and when they talked what they said was plain horse sense with a spice of real American humour. They did not think they were going to win the race, but they thought they might put up a good show. They said that their machine is still an experiment, and they demonstrated that it is an experiment which is well worth developing much further.

One judges that Mr. Rhinehart is of Irish extraction, descended from one of those families from the Palatine Provinces of the Rhine which were planted by George II in the counties of Tipperary and Limerick after the mere Irish had been exterminated according to English custom. These families ultimately became more Irish than the Irish themselves, and, combining German thoroughness with Irish quickness, caused the English more trouble than did the original Irish. At any rate there are many Rhineharts in that part of the country.

Mr. Rhinehart's methods reminded one of them. He seemed to take things easily and casually, but he was immensely thorough in the way he worked on his machine. She was distinctly awkward to handle, owing to her fin surface aft being insufficient, so he added two temporary fins by screwing a small vertical plate on each end of the tail plane. Even then she had not enough fin surface, but he handled her beautifully in the air, and made an excellent landing, showing that he has very quick eyes and hands for all his apparently leisurely movements.

One hopes to hear more in the future of this very promising experiment and of her excellent pilot. Perhaps when Mr. Rhinehart is back home he will be so good as to report progress at intervals to this paper. Meantime one wishes him every success with his future experiments.

The U.S. Army Effort.

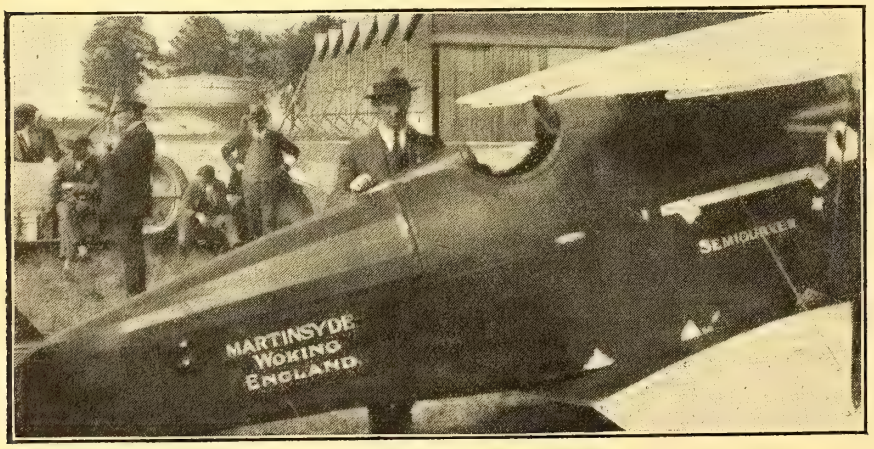
The second American representative was the U.S. Army's Verville racer, with a Packard engine which was sometimes called 500 h.p. and sometimes 600 h.p. There seemed to be a diversity of opinion about its power. Possibly the makers are not very sure about it. Certainly the engine itself was not.

The aeroplane is a very ordinary affair, with rather good lines, but nothing about which to write home. It looks as if it had been designed by a committee of competent draughtsmen rather than by a single designer of talent, and certainly not by a genius. The most interesting thing about it is the leather girth with hand-holds attached which it wears when on the ground to facilitate handling. This is shown in the illustration and seems worth copying. It is removed when the machine is ready to start.

The whole machine is obviously immensely heavy, quite apart from its big engine, and though it is certainly fast it is probably nothing like so fast as it looks.

The pilot of the machine was Major Schroeder, holder of the World's Altitude Record, with 33,000 ft. Like the Dayton-Wright people, Major Schroeder and his crew worked much and said very little. Being well over six feet high, Major Schroeder is naturally known to his compatriots as "Shorty." He is one of the old hands in American aviation, having begun as a mechanic in the days of Arch Hoxsey and George W. Beatty. During the war his skill and experience led the authorities to keep him at home on technical work, where he more than justified his existence.

Like all the real good Americans of the war-time type,



Mr. F. P. Raynham, with his Martinsyde "Semiquaver," waiting to start in the Gordon Bennett Race. Behind him are to be seen Mr. Hurst, the inimitable Ricketts, Mr. Tait-Cox, and Mr. Folland, sitting on Colonel McClean's car. The sheds in the background are those of the French Military Aerodrome at Ville-Sauvage, where the race was held.

Major Schroeder is out to learn rather than to teach, and one believes that this visit to France will not be wasted. Before the race he owned frankly that he did not fancy his chances. He had only flown the machine twice in America, and though he knew her speed was good he was not sure of her staying the course.

Obviously, the radiator was far too small for the huge engine, and apart from that the engine sounded all wrong. A British spectator who heard it running the day before the race described it as sounding like a "can full of nails"—which, in fact, was rather an apt simile, except that it made such a row that he might have called it a boiler full of rocks.

On the whole, if a race were organised between aeroplanes designed and built by the Air Services of various nations, one would certainly back the Royal Aircraft Establishment at Farnborough to give a handsome beating to McCook Field, as well as to the Section Technique of the French Service d'Aviation. At the same time it was a thoroughly sporting effort on the part of the U.S. Army aviation people to put up the third American entry, and one hopes to see Major Schroeder in another big race on this side of the water with a machine which is more worthy of his very evident ability as a pilot.

The Comic Cox and Co.

The comic relief of the American team, which otherwise was in deadly earnest, was provided by Mr. S. J. E. Cox, who apparently bought and paid for two Curtiss racing machines and transported them and their crews all the way to France at his own expense. If he had stopped at that and kept his mouth shut all would have been well and he would have gone down to history as a "Mæcenas of Aviation"—as the French journalists used to love to call the late M. Deutsch de la Meurthe. It is such a pity that so few

AT THE GORDON BENNETT RACE.—At the top are four views of M. Sadi-Lecointe's winning Nieuport. Below it are a front and side view of M. de Romanet's Spad, with M. Herbemont and M. de Romanet standing alongside it. To the right is Major Schroeder's Verville, with the lifting girth still round the fuselage. It will be noted that the American Eagle painted on its side appears to be making a bad landing. Below the Verville are two views of Mr. Rhinehart's Dayton-Wright, showing the holes into which the wheels fit. In the left bottom corner is Mr. James and his "Czech" Nieuport, backed by an admiring crowd.

millionaires realise that God intended them to write cheques and not to talk.

Unfortunately for him, but fortunately for the joy of nations, Mr. S. J. E. Cox chose to pose as an authority on aviation, as the designer of his Curtiss machines, as the general of the campaign to win the Gordon Bennett Cup, and as the certain winner. He talked the worst kind of hot air to international journalists and international aviators alike, with the result that when anybody felt bored or depressed they merely went and had a heart to heart serious talk with Mr. Cox and then retired quietly to a corner and laughed till they felt better. The cream of the jest, of course, was that Mr. Cox took himself quite seriously and seemed quite oblivious to the fact that after his first day in France everybody had him exactly sized-up and merely talked to him for the sake of pulling his leg.

Who Mr. Cox was before he took himself in as a patron of aviation one does not know. One of his compatriots described him thus :—"Cox was in Texas and gotten tired, so he set down on the ground, and after settin' a while he felt the ground was damp, and then he found he was settin' on a leak from an oil well. And that was what he done to get rich." Undoubtedly that is not the correct history of Mr. Cox's wealth, but as an example of American description it is worth recording.

His aspect was as diverting as his talk. Tall, thin, aquiline and swarthy, clad in an expensive black broadcloth suit and a heavy black overcoat, with an umbrageous black sombrero on top, and a pair of preposterous browny-yellow boots below, he looked like what a humorous artist might produce if asked to depict a Mexican Baptist Minister.

He carried an opulent cane with a hook at the top, the hook and about a third of the length being heavily armoured with gold. One of the British contingent besought him, if he broke his cane, to let him (the Britisher) have the top half. And Mr. Cox was quite pleased with the ostensible compliment to his good taste.

It was really rather unkind to refuse to take Mr. Cox seriously, for he did mean so well and he did try so hard. But he is so "young" in the eyes of this ancient Continent of Europe, and so very pleased with himself, that it would have been a waste of good material not to have used him, as Providence so obviously intended, as an inexhaustible source of laughter. Therefore the European aeronautical people at the Gordon Bennett Race do honestly feel grateful to him for coming to "Yew-rope" to cheer us in our prevailing depression. And it was a trifle unreasonable of his compatriots to speak of him as they did, for they can rest assured that we Europeans do not imagine that all Americans, not even all American millionaires, are as is Mr. S. J. E. Cox.

At the same time one wishes that we had a few like him in England. With a little training they might be taught to be quite nice about the house and very useful to aviation.

The Curtiss Crash.

Mr. Roland Rohlfs, the "Cox" pilot, is another of the quiet Americans who do much and talk little. He was in no way responsible for the eagle-shrieks about what his machine was going to do. Everybody was very sorry about his accident on Sept. 26th, and everybody was very glad that he escaped with so little damage that he was able to be a spectator of the race on the 28th. The crash happened in this wise :—

The Cox-Curtiss crew had located themselves at Villacoublay, near Versailles, instead of at Etampes. Whether this was to enable Mr. Cox to be nearer the Parisian Press, or whether the two other American crews did not want him at Etampes, seemed to be a subject for dispute. Anyhow, on the Sunday evening Rohlfs flew over to Etampes on the "Texas Wild Cat"—the choice of his two mounts—so as to be in time for the measurement and sealing of the competing machines on the Monday.

He arrived in the dusk, landed at about a hundred miles an hour across the wind and diagonally to the slope of the ground. His machine gave one big bounce. Both wheels crumpled. The points of his undercarriage dug into the ground. And the machine turned a half somersault, landing flat on its back.

Rohlfs was stunned and a trifle bruised and cut. He was revived, according to *Le Journal*, by *"soins energiques,"* which apparently consisted of artificial respiration and copious doses of brandy. Such "energetic cares" are scarcely suitable to a concussion case, and may account for the high death-rate among pupils at the French schools of military aviation during the war. However, Rohlfs is tough, and coming from a dry country probably his constitution was able to absorb the brandy without prejudice. So he survived all the energy expended on him, as well as the bumping along the awful road to Etampes in a motor-lorry, anything in the nature of a proper ambulance being entirely outside the reckoning of either the Military or Civil authorities at Ville Sauvage—a place which in its medical, surgical, sanitary and catering arrangements thoroughly deserves its name.

The "Wild Cat" stood the bump amazingly well, but the fuselage broke at the pilot's seat. She was brought in next day, minus her tail, in a state which emphatically belied all the peculiarities commonly attributed to the species.

One was told later on that in order to increase his speed Rohlfs had had smaller wheels built in France. The spokes used for the rebuild had pulled through the hubs at the first impact and so at the second the points of the undercarriage were all that was left on which to land. The wing-struts, undercarriage vees and axle all form a solid structure, so there is no possible way of fitting shock-absorbers for the wheels. It is not surprising, therefore, that the wheels collapsed. It would have been very surprising if they had not.

And that was the end of the Comic Cox and Co.

The British Team.

The British team was to consist of Mr. Hawker on a Sopwith, Mr. Tait-Cox on a Nieuport, and Mr. Raynham on a Martinsyde. The fate of the Sopwith is already known. Despite the efforts of the little group of true sportsmen in the Royal Aero Club, it was impossible to get the machine through in time after work on it was stopped by the Sopwith firm going into liquidation.

The Martinsyde was duly towed to Etampes by Messrs. Raynham, McGeagh Hurst, and Blackwell. And the Nieuport was to be flown across by Mr. Tait-Cox, as apparently Sir Samuel Waring did not feel justified in going to the expense of providing road or rail transport for her. The Nieuport's journey is worth recording.

The Odyssey of Mr. James.

On the Friday Mr. Tait-Cox was very ill—far too ill to fly—so Mr. James, the firm's second pilot, decided to take the machine across. He took her up for a trial trip at Hendon and a flying wire broke. As the Nieuport has I-struts with single flying wires and no incidence bracing, the breakage of the wire resulted in a deformation of the wing which put the machine into a skid, and would probably have killed most pilots. Mr. James, by a wonderful exhibition of skill, saved himself and made a perfect landing.

After some delay, owing to these wires being of a special length, the wire was replaced and he left on Sunday for France. Being a racing machine the Nieuport had not enough petrol capacity for the full journey to Etampes, so Mr. James landed at Lympne for petrol and Customs clearance.

When he arrived he found that the regular Customs officer was away on leave, and that his *locum tenens* was out, so that there was nobody who could clear him for the Continent. The people at the aerodrome, in duty bound, refused to let him go until his papers were duly signed. The result was that he was kept waiting for nearly three hours before an official arrived who could clear his papers. By that time it was too late for him to reach Le Bourgêt before dark, so he had perforce to stay the night at Lympne.

This seems to be a matter which the Director-General of Civil Aviation should investigate. If it be true that a machine can be held up for two or three hours at a Customs aerodrome owing to the absence of the proper official, then evidently something needs reorganising.

If the system permits it, then the system must be altered. If the "competent authority" was away from duty without authorisation from those above him, then the official at fault must be removed forthwith. It is absurd that we should maintain a Department of Civil Aviation and all its officials if the one object of Civil Aviation, rapidity of locomotion, is to be defeated by the badness of its organisation or the slackness of its officials.

The Result of Official Delay.

Whatever or whoever was at fault, the result was that this official delay certainly cost the British team its second representative and very probably the race, for this Nieuport has actually done greater speed than that done by the winner. Therefore it is hoped that the Department of Civil Aviation will issue an official statement on the matter.

Eventually Mr. James left Lympne on Monday, and after landing several times to ask his way he arrived at Le Bourgêt. If he had arrived, as he should have done, on Sunday, he would have been at Etampes on Monday for the official inspection, and all would have been well. As it was he arrived at Le Bourgêt on Monday and remained there, thinking that he would be in plenty of time if he got to Etampes early enough to fly on the Tuesday.

This omission to understand the rules is certainly an example of bad organisation in the Nieuport team, for one of the very first essentials in all competitions is that everybody concerned shall know the rules by heart. As many competitions have been won by knowing the rules and defeating them as by good performance. And as many have been lost by

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ignorant infringement of rules as by bad performance. This is a case in point. But whether or no, there is no excuse for the holding up of the Nieuport at Lympne till it was too late for Mr. James to continue to Paris that night.

In the end Mr. James arrived at Ville-Sauvage at lunch-time on Tuesday, having landed two or three times more to find his way. He had pulled a tyre off its rim when leaving his last stopping place and landed perfectly without it. The blue-and-yellow chequered painting of the Nieuport pleased the French crowd, and the French journalists were still more pleased when a British hanger-on informed them that this was *"le representatif Checko-Slovak."*

Mr. Folland, the designer of the Nieuport, and Mr. Tait-Cox—now partially recovered—had come over by rail and boat, and were naturally bitterly disappointed that, after all its journeyings and after all Mr. James's pluck and skill in flying a projectile of this species across country and making half a dozen landings safely in odd neighbourhoods, the machine was unable to compete. The sum of it all is that their travelling expenses and the cost and wear and tear of flying the machine over has been simply wasted.

It would have cost Sir Samuel Waring, Bart.—who was given his baronetcy for his services to aviation—very little more to have provided adequate transport. His machine would very probably have won the race and with it a reputation worth thousands of pounds. The whole thing is an excellent example of the good old policy of spoiling the ship for a ha'p'orth of tar.

THE RACE ITSELF.

Waiting for the Weather.

The actual Gordon Bennett Race itself takes little describing. It was really a competition against time. Competitors were at liberty to start when they liked between 07.00 hours and 19.00 hours (otherwise 7 p.m.), and the one who did the fastest time was the winner.

The early morning was foggy and there was no sign of the weather clearing till mid-day. The French weather report at 10.10 said: "A stormy movement comes from the Gulf of Gascony, advancing itself over Brittany. Mist and fog in all regions. Time humid and soft. Wind south-west to south-east." As a matter of fact, the wind was strong from the north-east, but the mist was there right enough. Visibility was that of London in November. Consequently, everybody did nothing, except discuss lunch and Mr. Cox, till well on in the afternoon.

A Bright Spot.

The British contingent were entertained at lunch by Lieut.-Col. Frank McClean and Mr. McGeagh Hurst, "to meet M. Sadi-Lecointe." This picnic was, in fact, the brightest spot in the day.

When Messrs. Raynham, Hurst and Philips arrived at Etampes, friendless and forlorn, M. Sadi-Lecointe, who all along regarded the Martinsyde as his most dangerous competitor, went out of his way to befriend the British crew. He lent them tools and men, he told them where to get everything they wanted to buy, he came and chatted with them whenever he was not busy on his own machine. In fact, if he had been bent on Mr. Raynham winning the Cup instead of himself he could not have done more. Nobody could have shown better sportsmanship.

Consequently the British visitors were honoured to have the opportunity of drinking his health and of wishing him good luck. And, be it remembered, it was distinctly a mark of honour that the French favourite for the race should lunch with the representatives of a rival country just before the race.

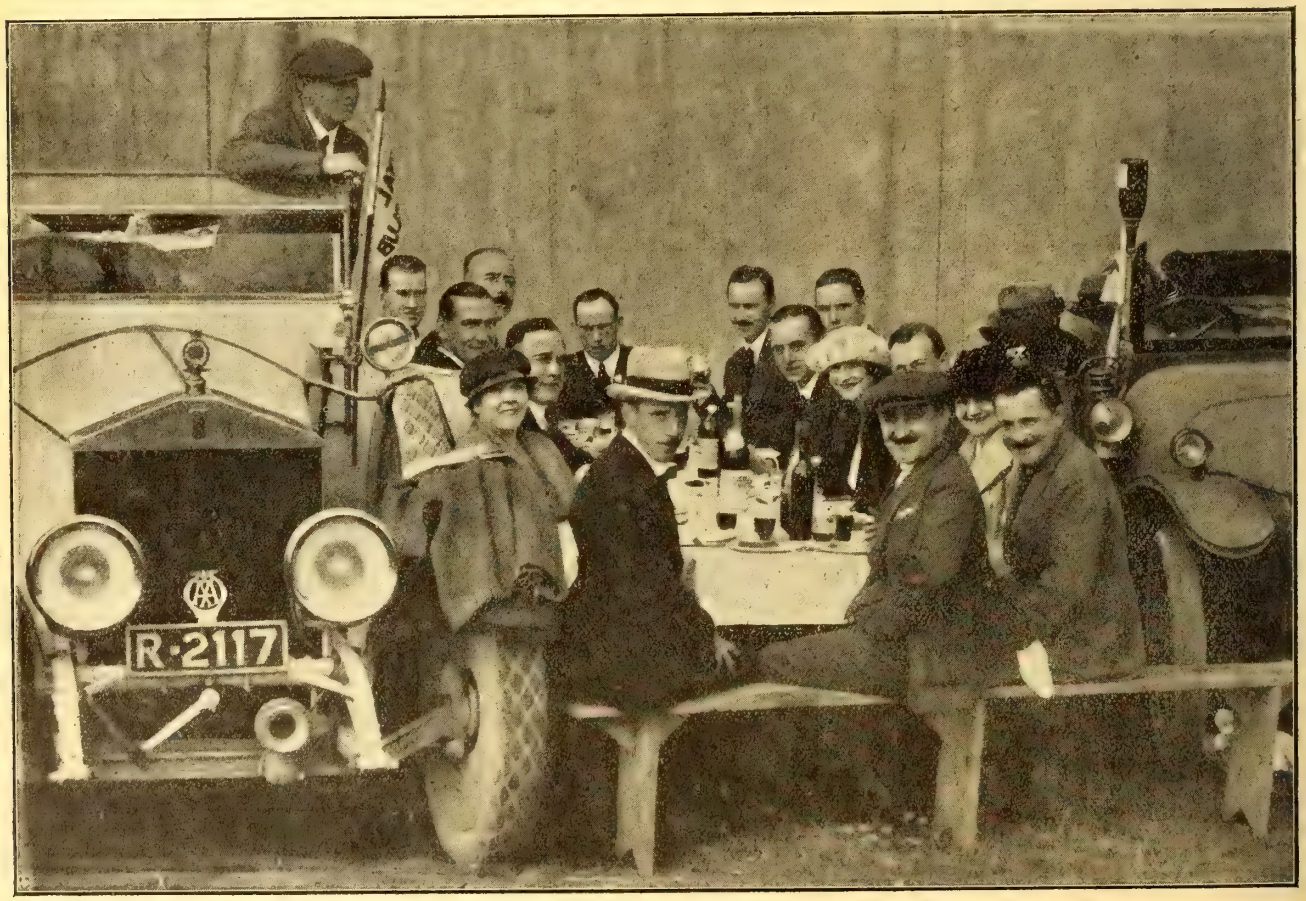
It was not till one arrived home again that one suddenly thought of the appalling risk we ran when M. Sadi-Lecointe accepted Mr. Hurst's invitation. Supposing the food or the wine had disagreed with him and he had in consequence been taken ill before or during the race. Would anything on earth or in Heaven have persuaded the French that the perfidious English had not doped the favourite? We should all have been massacred on the spot, beginning with Mr. Hurst.

Happily, M. Sadi-Lecointe remained in the best of health, and so did his engine. Thus we escaped from danger and had the felicity of congratulating him on his victory not merely as his unsuccessful rivals but as personal friends.

The Start.

The first to start, when the clouds blew away, about 14.00 hours, was M. Kirch. His career was short. He did one very fast lap of 21 min. 29 sec. for the 100 kilometres, and then a slow one of 27 min. 23 sec., finishing the lap with his engine missing badly. Then he turned and landed. One was unable to acquire any exact information as to what had gone wrong.

(*Continued on page* 625.)



IN HONOUR OF M. SADI-LECOINTE.—The winner of the Race is on the right, in front. Among the others may be seen Lieut.-Col. McClean, Lieut.-Col. O'Gorman, Major Hay, Major Mayo, Lieut.-Comm. Perrin, Mr. McGeagh Hurst, and Mr. Stevenson. Mr. Raynham is modestly hidden behind the French gentleman in the front row.

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THE WEEKLY COMMENTARY.

There will be found below sketches and descriptions of the salient features of the amphibian attachments to the Supermarine and the Vickers flying-boats at the Air Ministry Competition for seaplanes which has just closed.

An account of the results of the Gliding and Soaring Flight Competition held in Germany between July and September is given in this issue. The Junkers-type cantilever glider which won the two principal prizes appears to have been a very interesting case of advanced design applied to experimental and sporting purposes.

A particularly striking feature is the number of local clubs which built and entered machines which performed well. There appears to be no such enterprise in England.

A short illustrated account of the Vickers-built rigid airship R.80—so far the only rigid airship completed in Britain since the Armistice—is given on page 616.

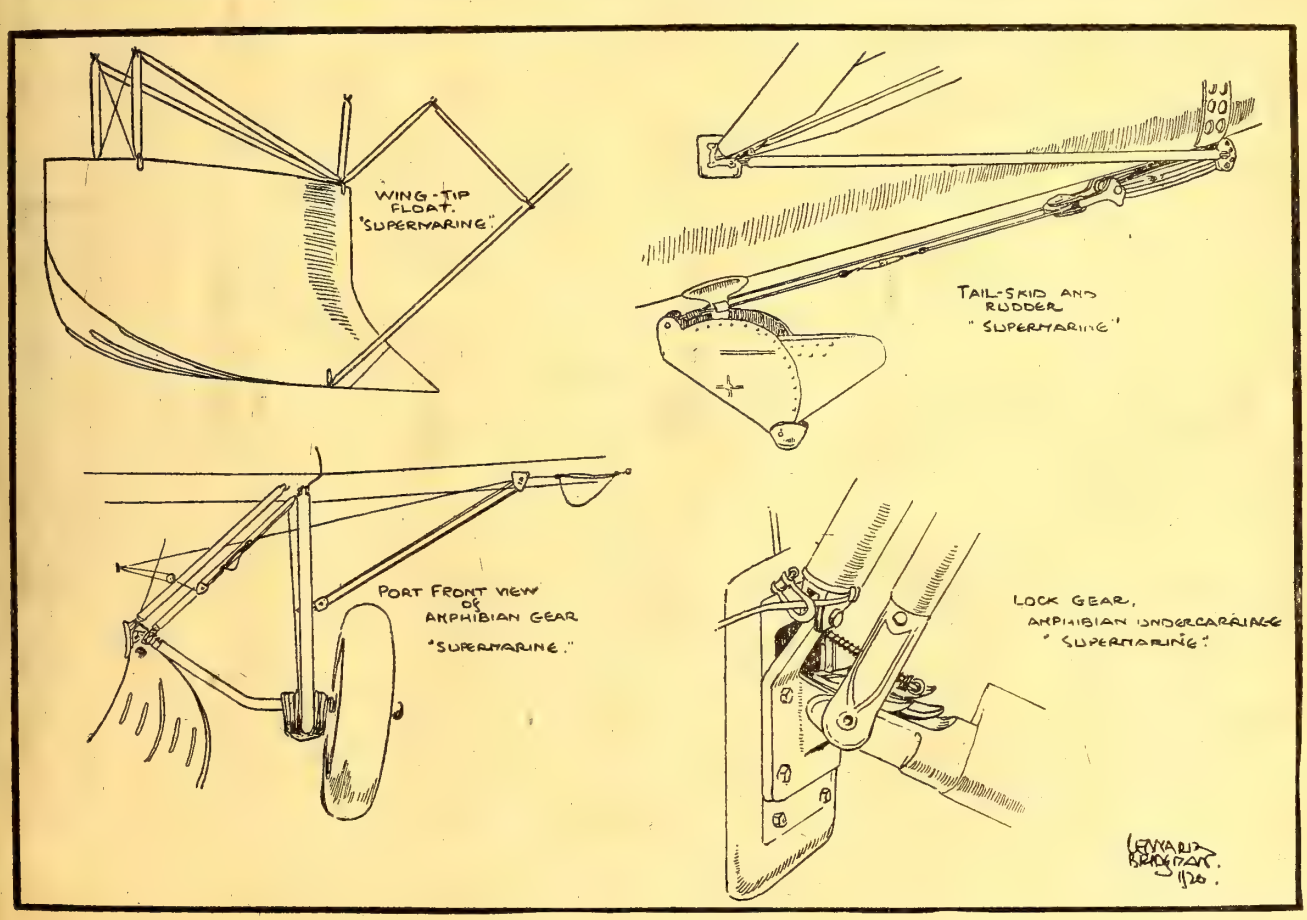
AMPHIBIAN UNDERCARRIAGES FROM MARTLESHAM.

It appears to be generally conceded by those at Martlesham best qualified to judge—and not exclusively by those appointed for that purpose—that, despite the small number of amphibian machines submitted for test in the Seaplane Section of the Air Ministry's Competition, those machines show distinctly more of novelty and represent a more marked departure from war-time conventions of design than did the entries for the Aeroplane Competition.

This is really only natural. Amphibians are to a large extent novel in themselves, and after the treatment meted out to seaplane designers by the Air Ministry and its predecessors during the war, only those possessed of a large measure of enterprise and pertinacity would be likely to make further efforts to secure official approval.

From the technical point of view it appears that the three amphibians entered have approached much more closely to the standard of performance called for in the rules than did the bulk of the aeroplanes in the preceding competitions. The complete results of all the tests are not yet available, but such figures as are to hand point in that direction.

Naturally, the most interesting features of all the amphibians are those connected with their alighting gear,



and more specifically with the movable wheel gear; and the sketches and notes hereafter deal entirely with these points.

The Supermarine Undercarriage.

One sketch shows the general arrangement of one side of the Supermarine landing-gear. The hinge point of the structure is at the top of a Vee of steel tubes of normal type, to which an axle is sprung in the usual manner. This axle bends upwards and is hinged to a light tube running up and outwards to the top of the front member of the vee.

When the landing carriage is in its working position the end of the axle passes into a locking catch attached to the hull of the boat and braced to the lower centre section by heavy tubes running to beneath the front and rear centre section struts. This catch takes the form of a pair of open jaws into which the hinge-pin on the axle itself passes, and by itself this catch positively prevents the undercarriage from folding inwards. The jaws are split centrally, and between them is a tongue, with an undercut hook on its lower face, which is pressed up by the hinge-pin on the axle end when the wheels are pulled down and snaps down over it when they are home. A laminated leaf spring above this catch, supplemented by a spiral spring surrounding the release wire, added to the weight of the catch itself, secures the locking of the gear.

A detailed sketch shows the general appearance of this lock. The two sides of the upper jaw fixed to the hull side are visible, projecting through the fork end on the axle tube. Between them, but dropped into locking position, is the tongue of the undercut locking hook, which has snapped over the hinge-pin. Running upward from this tongue may be seen the pull-off wire—surrounded by the auxiliary spiral spring—which lifts the catch when the wheels are folded.

The general arrangement sketch shows clearly the four-fold purchase cables which are used to pull the whole arrangement to its desired position. It should be noted that, owing to the oblique tubes running from the catch to the lower centre section, no severe loads are transmitted through the flexible hull in landing, but that they all pass to the wing structure, and that in any normal landing there is very little load tending to fold up the undercarriage. The designer is confident that, even in the event of the locking gear failing to spring home, the operating cables would suffice to hold the wheels in position for any but a distinctly bad landing.

The combined tail skid and water-rudder is ingenious and extremely effective. A vertical steel tube in bearings passes right through the hull and is furnished at its upper end with a transverse lever of the usual "bloater" type. To this the rudder control cables are attached, passing on thereafter to the air-rudder proper. The tail skid frame is built of galvanised sheet steel bent up to a deep U-section, pivoted near the bottom of the U to the vertical tube within it.

From the forward upper end of this frame two cables pass aft round a pulley, and this pulley is suspended from the boat stern by rubber shock-absorbers. The object of the pulley is to secure that the springing shall not resist movement of the rudder. It can be seen that, were the cables fastened off at their ends to the rubbers, sideways movement of the water-rudder would tighten up one cable and stretch the rubber, thus putting an unnecessary load on the pilot.

The main water-rudder frame has riveted to it a rearward portion of similar construction to the frame itself, which serves as streamlining in the air and as effective rudder surface in the water. The point of contact with the earth is furnished with a hardened removable shoe, which is understood to have been very effective in resisting the attacks of Martlesham "Tarmac."

The water alighting gear calls for little comment, as the hull is of the well-known Supermarine flexible type of construction, and the wing-tip floats are similar to those used on the Channel type. Instead of being directly attached to the underside of the lower wings, they are in this case carried on steel tube struts, and are braced against side loads by the rigid bracing shown in a sketch.

The "Viking III."

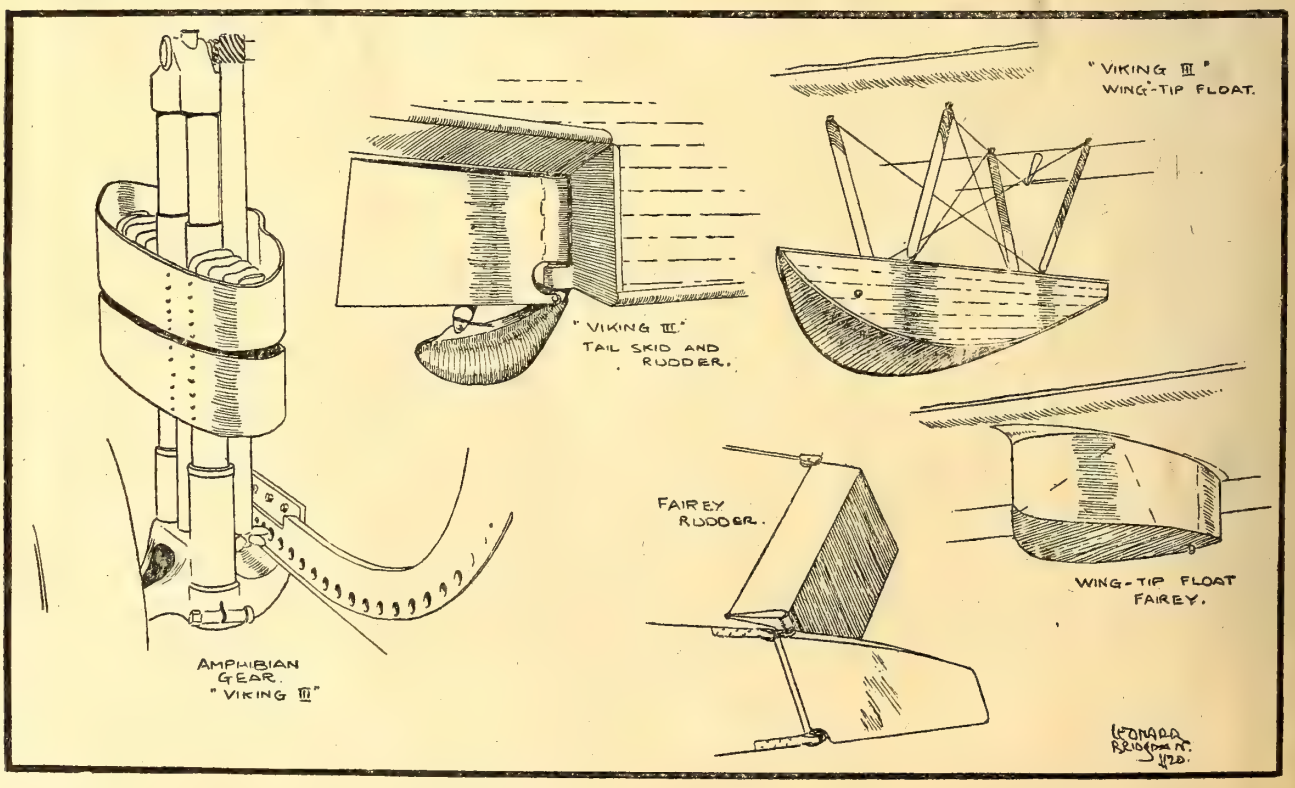
The wheel gear of the "Viking III" remains unchanged from that of the "Viking II" of the Olympia Show. It will be remembered that in this case the whole wheel gear is rotated about an athwartship axis by a kind of circular rack and pinion gear, whereof the rack is attached to the hull side and the pinion is at the base of the wheel frame. The general arrangement is clearly indicated in a sketch. The wheel itself is overhung from a heavy crosshead, rubber and Oleo sprung on a steel tube frame which serves as a guide. This frame is pivoted at its upper end and is rotated by the "Humphriss" type pinion carried at its lower end when this is operated through an irreversible worm-gear concentric with the pivot and a long shaft parallel to the rotating frame. At the lower end a claw-like projection from the tubular frame engages with the edge and the inner side of the heavy steel quadrant carrying the rack, and it is thus prevented from splaying outwards.

When the wheels are racked right down the frame passes somewhat over the vertical, and landing loads tend to force the wheel-carrying frame hard against a stop on the frame and, in addition, the irreversibility of the worm-gear controlling the pinion acts as an effective lock.

The combined water-rudder and tail skid of this machine is also shown. The water-rudder is a sheet-metal shell, of rectangular form, hinged behind the rear step of the hull. To its lower forward corner a steel spoon skid is hinged, which is further supported aft by a sprung telescopic tubular strut passing to the interior of the rudder above.

The Fairey.

As the Fairey was not available for study at the time of the visit of The Aeroplane's representatives, it is proposed to describe this in detail at as early a date as possible.



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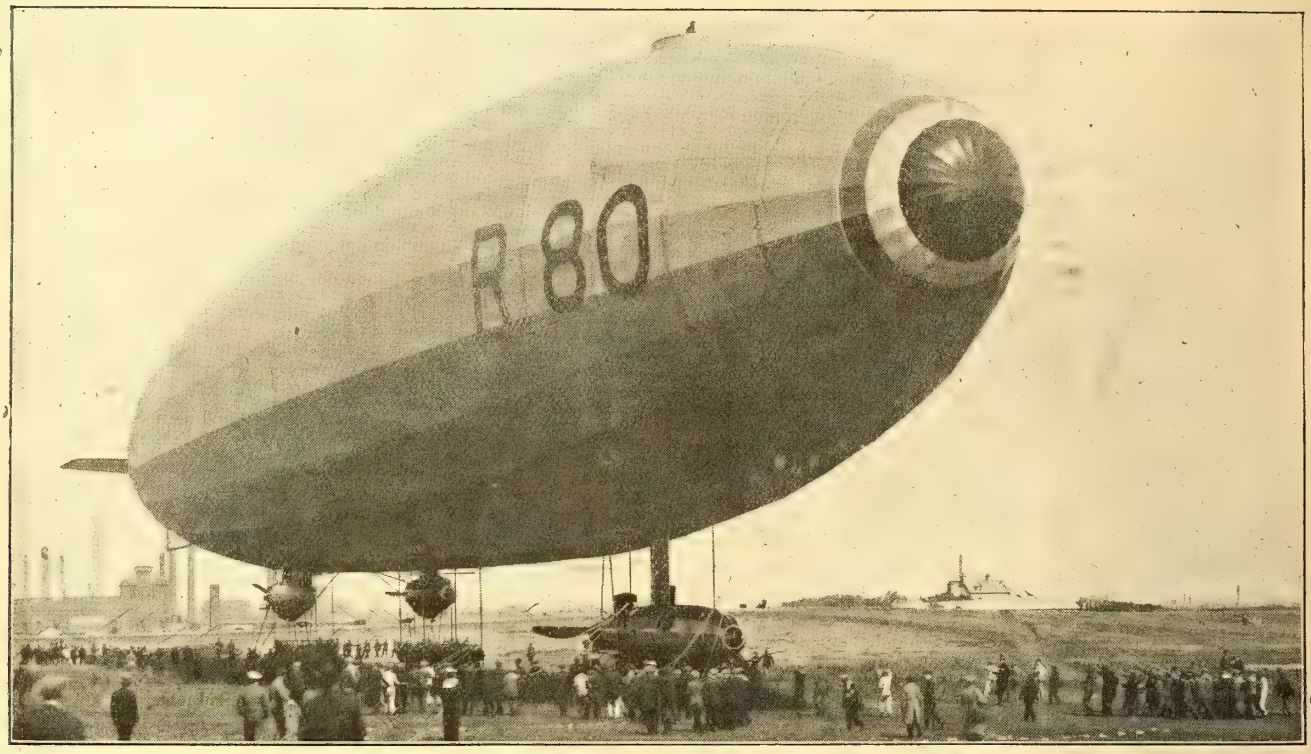
THE AIRSHIP R.80.



R.80 at Barrow about to start upon a Test Flight.

R.80—one of the very few airships which the world has produced since the signing of the armistice—was described and illustrated in the special Airship Number of this paper (Aug. 20th, 1919). She was not then quite complete, but in the normal course of events she would have taken the air within a month or two of that time.

Actually, owing to the very numerous causes which have combined to retard the development of airships in this country, she was not completed till nearly a year later, her first air trial having occurred on July 19th, 1920.

The history of R.80 dates back to 1916, the preliminary designs having been drawn up by Vickers Ltd. on the basis of their experience with R.9, R.23 and R.26, and when particulars of the German L.33 became available, certain improvements based on this class of ship were embodied in the design.

Owing to the small dimensions of Vickers' Walney Island airship shed, it was not possible to build there a ship of such size as the L.33, and the R.80 design was an effort to reach a very high performance and efficiency in quite a small ship—one over 100 ft. shorter than the L.33 and the similar R.33 and R.34.

The most obvious feature of the design is the attention paid to the shape of the body. Unlike all previous rigids, the body had no parallel portion whatever, and the ratio of length to diameter was kept lower than in previous practice.

In this respect the Zeppelin firm have followed Vickers' practice in the *Bodensee* and *Nordstern*, for, although both these ships were actually completed before R.80, it seems probable that the designs are of later origin.

Very great attention has also been paid to the form of the cars, with intent to reduce the resistance of the whole ship to a minimum, and thus mitigate the difficulties of reaching a reasonable performance in a small ship. The hull structure is of the normal duralumin girder type, the main frame rings built of triangular section lattice girders with radial steel wiring, and longitudinals of a similar type. An internal triangular corridor, built up in the same way as the main frames and longitudinals, runs along the bottom of the hull and provides living-quarters for crew, petrol and water stowage, and forms the main communication way along the ship.

From this gangway a ladder in a fabric tube, between two gas-bags, gives access to a walking way along the top of the ship, and thus to the top gun-platform.

The bow of the ship is fitted with a mooring coupling, enabling the ship to moor to a Vickers type mooring mast. The general scheme of this mooring arrangement was fully described in the already mentioned Airship Number of this journal. A special feature of the Vickers mooring arrangement is that a door in the nose of the ship gives direct access from the internal corridor to the platform on the mooring mast, and there is therefore no need for actual landing to disembark or re-embark crew, fuel or stores.

As R.80 was designed for war purposes the armament arrangements were of the latest type. Particular features of these are the gunpit aft of the control surfaces, in the extreme tail, and a specially rigid gun-platform over the bows, which is destined to mount a high-velocity semi-automatic two-pounder gun.

There are apparently three cars suspended from the hull, but in fact there are four, as the control car and the power car which immediately follows it are two separate structures,

The Vickers-built Airship R.80 returning from her trials.

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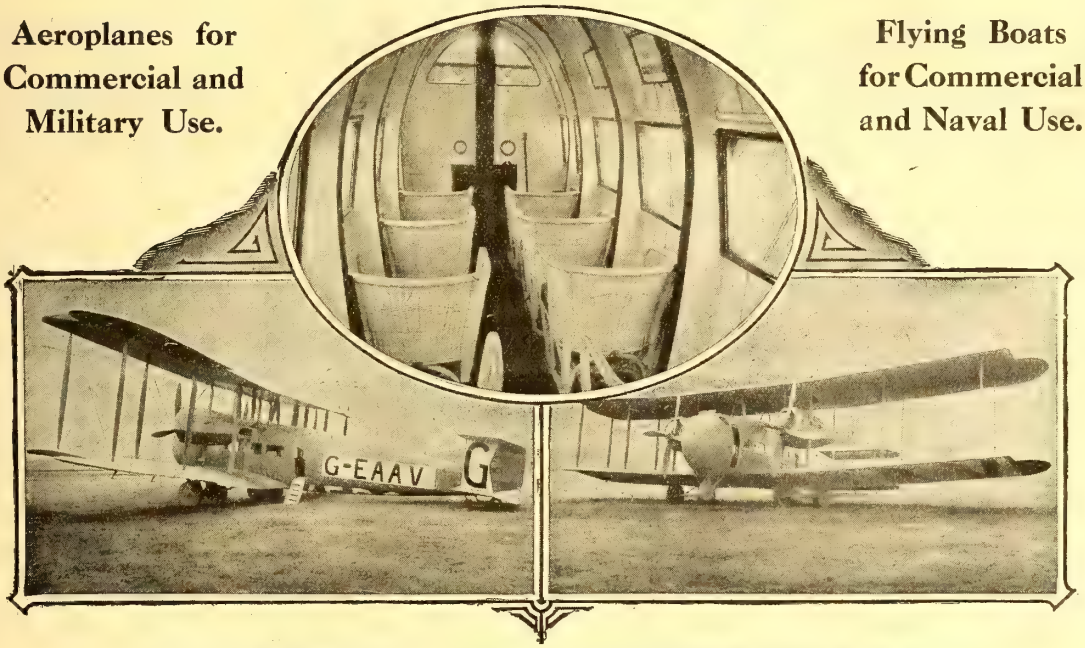

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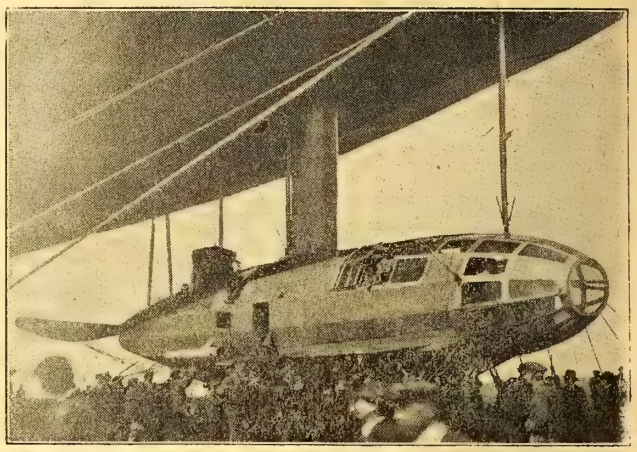
with a flexible coupling allowing direct communication from one to another, but designed not to transmit engine vibrations to the control station. Nearly amidship are two wing engine cars.

All these cars are duralumin girder structures, polygonal in section, streamline in elevation, and covered either with duralumin plating in way of the engines, or with doped fabric, except in such parts as are Triplex glazed. The forward power car is fitted with two, the wing cars each with one, Wolseley-Maybach engines of 230 h.p. The two forward engines are geared together through clutches, and either or both may be used to drive the propeller. The wing car engines are fitted with reversing gears.

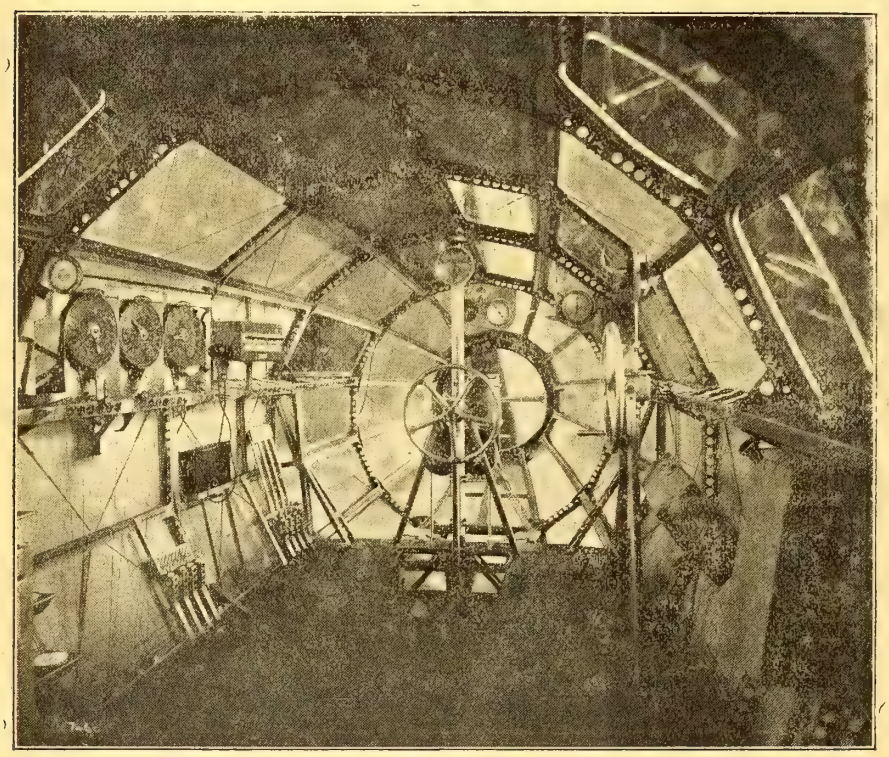
The main dimensions of R.80 are given in the attached specification.

Specification of R.80.

Length	530 ft.	Engine h.p.	920
Diameter	70 ft.	Maximum speed	65 m.p.h.
Height overall	85 ft.	Cruising speed	50 m.p.h.
Capacity	1,250,000 cu. ft.	Petrol capacity, 60 hr. (full power)	
Total lift	38.5 tons		
Disposable lift	17.5 tons	Range—	
Water ballast capacity,	10 tons	Full speed	3,900 miles
		Cruising	6,500 miles



The Forward Double Car of R.80.



THE CONTROL CAR OF R80.—An interior view looking forward. In front centre the steering wheel, from which the helmsman has a clear all-round view through the glazed nose. On the left side abreast the wheel is an intercommunication telephone exchange, followed by the engine-room telegraphs to the three engine gondolas. On the left the elevator control wheel may be seen.

GERMAN AERIAL ENTERPRISE.

A GERMAN GLIDING AND SOARING COMPETITION.

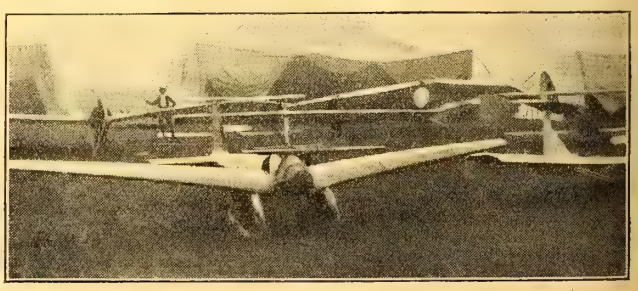
There have just been received the results of the gliding and soaring flight competition held in the Rhön district by the League of German Model Aircraft and Gliding Clubs. This competition was held during July and August, under the management of Herr Oskar Ursinus, editor of the German journal, *Flugsport*, and it has been supported—in the matter of prize-money—by the German Air Ministry, by the directors of German aircraft concerns, and by various of the aeronautical organisations of the country.

It is interesting to note that poor defeated impoverished Germany can thus maintain enthusiasm for the further Conquest of the Air, while we in this rich well-fed country cannot maintain a single Aero Club which does anything actively for the Progress of Aviation. The number of local clubs which entered for this German competition is truly remarkable.

The meeting was marred by one distressing accident, resulting in the death of the well-known pilot, von Loessl. This was due to breaking in the air of the elevator of his machine.

Among the machines which appeared, the following brief account gives particulars of some of the more interesting. The monoplane entered by the Aachen Aeronautical Society and designed by Klemperer was a rigid cantilever-wing affair, built up of plywood, and evidently based on Junkers aeroplane practice. The wings, the front part of the body and the undercarriage are built up as a single unit of plywood girderwork, fabric covered, the tail and the rear fuselage half forming another unit. The undercarriage consists of a pair of sprung skids, supported beneath a pair of streamlined "trousers" which project from the wings. These "trousers" are, like the rest of the structure, built up of carefully lightened three-ply girderwork. The span was 9.3 metres, length 6 metres, height overall 1.5 metres, and wing area 16 sq. metres. The weight empty was 57 kg., or with pilot 117 kg.

The glider entered by Senator Zeise was a monoplane of the Zanonia leaf or Taube type, with one rigid strut from the



Some of the Gliders at the Camp. In the foreground the Klemperer Cantilever Monoplane.

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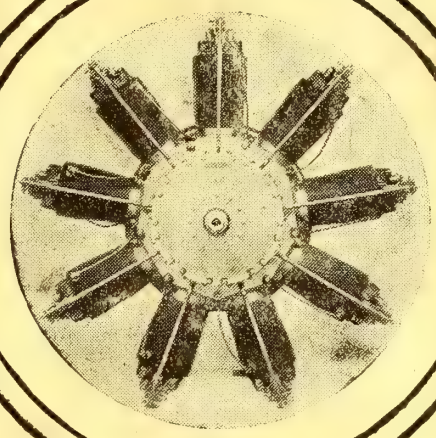

The Engine illustrated is the DRAGONFLY—340 h.p.—9 cyl. (Static Radial).

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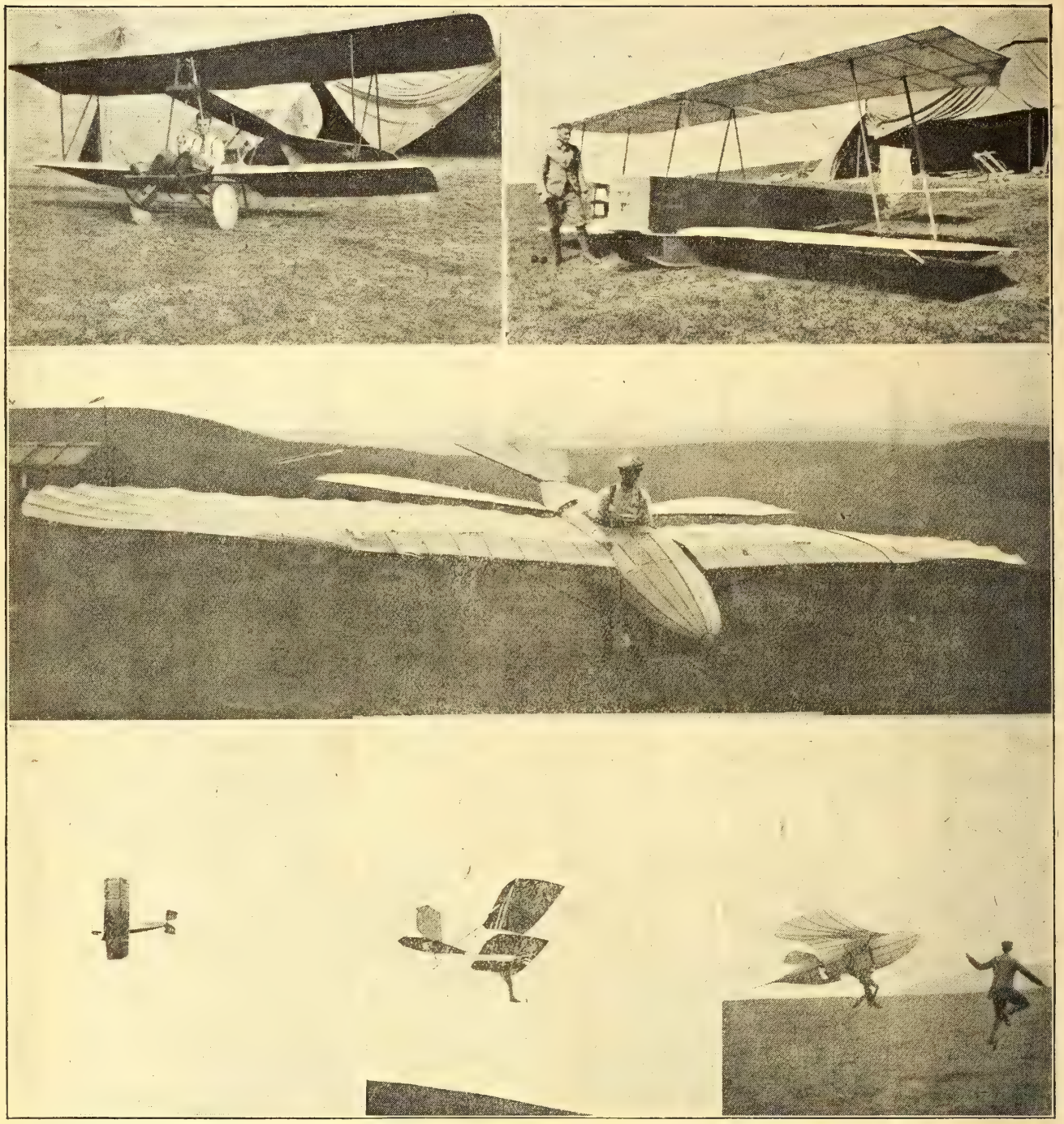

SOME OF THE GERMAN GLIDERS.—Top, left, the Drude, Schlack and Schalk Biplane. Right, the late Eugen von Loessl and his machine. Centre, the Zeise "Taube" with auxiliary flapping wings. Bottom, left to right, von Loessl on his last flight, Pelzer in the air, and the Zeise monoplane landing.

bottom of the fuselage to about one-third of the span along the wing each way. The wings were built largely of bamboo, great flexibility being aimed at. Control was effected by warping the wing-tips, which were used for lateral and longitudinal and directional steering.

Behind the main wings was fitted a smaller pair, also of flexible construction, and arranged to flap by the action of the pilot's feet on a set of pedals. Aft of this again was a small fixed tail plane. A streamlined fuselage supplied the connecting link between the three sets of surfaces, and bamboo skids were fitted below the body nose to protect it, though the main landing shocks were apparently taken by the pilot's legs, which project down through the bottom of the body. The span was 9.5 metres, length 4.2 metres, area 10.6 sq. m., and weight empty 40 kg. Gliding required an airspeed of 12 to 14 metres per sec.

Herren Drude, Schlack, and Schalk, of Berlin, were represented by a biplane, 6 metres span, 3.8 metres long, and of 12 sq. metres surface. The tail was carried on a member supported from the central wing struts, the pilot being seated on the lower plane over a somewhat Wright-like skid undercarriage to which wheels could be attached.

Von Loessl's machine was a normal type of fuselage biplane with warping wings, a balanced elevator with no fixed tail surface and a balanced rudder. The span was 7.2 metres, length 5 metres, area 20 sq. metres, and the flying weight, including pilot, was 120 kg. On Aug. 8th von Loessl covered a distance of 395.5 metres with a drop of 99 metres in 40.5 sec. against a wind of 6.5 metres—an air speed of 16.5 metres per sec. The next day he started against a wind of 7.5 metres per sec. and had been in the air 1.5 min. when the elevator broke.

Herr Robel entered a parasol monoplane with 21 sq. metres of surface, with a three-ply fuselage and warping wings. This was of 11 metres span and 7 metres long over all.

Herren Richter and Harrenstein entered a triplane, 4 metres span, 3.8 metres long, and 18 sq. metres surface, which was badly damaged after an early flight of 220 metres.

A biplane belonging to the "Nurnberg Pilot Preparatory School," wherein the pilot hung from the lower wings in the ancient style of the earliest gliding enthusiasts also appeared. This, of 5.6 metres span and 15 sq. metres surface, weighed only 15 kg. unloaded. Glides up to 343 metres were accomplished. This machine was flown by Herr Pelzer.

The Darmstadt Aeronautical Association was represented by

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a monoplane designed by Herr Braun, of 7.5 metres span, 10.5 sq. metres surface, and weighing 19 kg. This machine was damaged early in the trials by landing side to wind.

The following table gives the main awards :—

Prize.	Winner.	Distance metres.	Height metres	Duration secs.	C*	Wind m.p.s.
Rumpler Prize for longest Duration (5000 marks) / Fokker Prize for longest Flight (3000 marks)	Klemperer	1830	330	142.5	7.04	4-5
Air Ministry Prize for Efficiency (3000 marks)	Klemperer	220	47	75	31	15-18
2nd Rumpler Prize for Duration (2000 marks) / Air Ministry Prize for 2nd longest Duration (2000 marks)	Von Loessl	770	58	52.2	9.6	0-3
Association of German Pilots Prize (1000 marks)	Richter	256	—	22.4	—	6
Air Ministry Prize (1000 marks)	Drude	29	15	13.2	9 4	8 10

* C = a measure of the apparent gliding angle. It is obtained by adding to the distance over the ground the product of wind speed and time of flight, thus giving the effective air distance of the flight, and dividing by the height descended. Thus the apparent gliding angle of Herr Klemperer in his Air Ministry Prize flight was "one in thirty-one."

Eugen von Loessl.

Eugen von Loessl, whose death marred the otherwise successful course of the competition, was a member of an old Austrian family, was 25 years old, and had recently been married.

In 1912 he took part in the gliding contest organised by the Darmstadt Flying Club in the Rhön district. He had learnt to fly early in 1914 at the Albatros School at Johannisthal, and should not be confused with his brother, Ernst, who flew for the Albatros concern and in conjunction with Hirth was responsible for some passenger altitude records at the 1914 Vienna meeting.

Eugen von Loessl flew on active service till 1916, and had received the Iron Cross, First Class. From 1916 to the middle of 1918 he was one of the Albatros firm's test pilots, leaving there for the Daimler Sindelfingen Works.

HOW AMERICAN AIR-LINE FIRMS ADVERTISE.

The following is extracted from a "throw-away" issued by the Arbon-Bristol Aeroplane Co., Tulsa, Oklahoma :—

"Money.—The one thing we are all trying to get, to keep, and to increase.

"Time.—The one thing we waste more than any other.

"Time means money.—Surely you wouldn't waste money, so why waste time?

"Save both by using aerial transportation.

"The Arbon Flying Field is conveniently located and equipped in a manner to furnish first-class ships and competent, trustworthy pilots on the shortest notice. They will take you anywhere at any time.

"They have Ships of various types—one-passenger, two or more passengers; some for excessive speed, going at a rate of 135 miles per hour—and others constructed to carry heavier weights; but every Ship is thoroughly inspected by the highest type mechanics before being sent out. They can accommodate any requirement that can be filled by Aerial Service.

"The Doctor will tell you that worry makes one nervous. We all know that when worried or nervous we are only about 50 per cent. efficient—any one of us.

"So why worry? There are as fine fish in the sea as have ever been caught—likewise : 'There are as fine roads in the Air as have ever been on Land.'

"Take advantage of your assets, namely—Oklahoma Air Roads.

"You do not have to pay for their upkeep nor their improvement (what a saving)—they are there for the asking, one of the best, but undoubtedly least considered, of the State's assets.

"The ground roads of Oklahoma are a joke as well as a tremendous handicap. Just put your business on a little higher plane—aviate—and overcome it.

"Graduate from High School and Pre Bellum methods of transportation.

"Aviate into college and Post-Bellum methods.

"You will not only profit by, but thoroughly enjoy the higher class.

"The City of Tulsa and the State of Oklahoma are both new, keen, progressive and aggressive—keep up with them—keep them in the lead in everything.

"Lets go! and go on up!!

"Aviate!"

Other remarks are :—"Come on up! The air is fine! Take a ride in the clouds. Watch the wonderful air birds leave mother earth and soar away into the clouds."

Though possibly not appealing to the directors of Air Lines, or their entirely unenterprising advertising agents, or, in this actual form, to a good many other people, it is better than not letting the public know that there are such things as air lines, as is the case in this country.—G. D.

NOTICE TO GROUND ENGINEERS.

No. 11, 1920.—Strength of Control Cables.

It is hereby notified: The use of 5 cwt. cable for aircraft flying controls provides an insufficient margin of safety. All cables used to repair or replace any part of the flying control system should have a breaking strength of at least 10 cwt. (Spec. 2 W.2).

Air Ministry, Sept. 27th, 1920.

COMPANY NOTICES.

New Company.

De Havilland Aircraft Co., Ltd.—Private company. Registered Sept. 25th. Capital, £50,000 in £1 shares. To carry on the business of manufacturers, inventors, designers, patentees, and repairers of and dealers in aeroplanes, flying-machines, airships, dirigible and other balloons, aeronautical apparatus, etc. The subscribers are: A. E. Turner, 324, Finchley Road, N.W.3, director of companies (500 shares); E. H. Neville, Bush Lane House, Cannon Street, E.C.4, director of companies (1 share). The first directors are: Geoffrey de Havilland, A. E. Turner, and C. C. Walker. Qualification: 250 shares. Solicitors: A. J. Greenop and Co., Bush Lane House, Cannon Street, E.C.

Mortgages, Charges and Satisfactions.

Norman Thompson Flight Co., Ltd. (in liquidation).—Satisfaction in full (a) on Jan. 26th, 1920, of prior lien debentures dated Feb. 10th, 1919, securing £40,000, and (b) on Feb. 10th, 1919, of charges dated April 20th, May 9th and 21st, and June 3rd and 13th, 1918, securing £4,000, £6,000, £5,000, £15,000 and £6,000, respectively.

Whitehead Aircraft (1917), Ltd.—Satisfaction in full on Sept. 7th, 1920, of mortgage dated Dec. 24th, 1918, securing £2,000.

Martinsyde, Ltd.—Debenture dated Sept. 16th, 1920, to secure £100,000 charged on the company's undertaking and property, present and future, including uncalled capital. Holders: London County, Westminster, and Parr's Bank, Ltd.

Navarro Wellesley Aviation, Ltd.—Mortgage dated Sept. 13th, 1920, to secure £10,000, charged on certain land and premises, etc., in Kingston-on-Thames. Holders: London and General Trade Bank, Ltd., 4 and 5, Suffolk Place, Pall Mall, S.W.

The 1920 "Bristol Bullet," with the Bristol "Jupiter" engine (450 h.p.) This machine was specifically designed for sporting purposes, and is built specially to withstand the stresses imposed by rapid manœuvres at high speeds. If there should chance to be any sporting flying in this country in the near future it may be expected to gain a great reputation.

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fitted with the 300 h.p. Hispano Suiza engine has now been thoroughly tried out at our Works and proved most satisfactory in every way.

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(*Continued from page 612.*)

M. de Romanet went next. By this time the sun was out and the air was fairly boiling. His first lap took 22 min. 52 sec., so he was obviously slower than the Nieuports. His next lap took 23 min. 15 sec., bringing his time up to 46 min. 7 sec. for the two laps.

To everybody's surprise he turned after crossing the line and landed. The Spad car went out to him, and after a delay of nearly 45 min. he went on again.

The Winner's Performance.

Meantime Sadi-Lecointe had started. Before crossing the line he took his machine up and threw it about as if it had been an ordinary scout instead of a racing freak. This was just by way of warming up his engine.

Then he came down to the starting line with a rush and went off downwind at a terrific speed. He was back again in 21 min. 36 3/5 sec., seven seconds slower than Kirch, but when he took the turn round the pylon one saw at once the master hand and mind which controlled the machine. He was certainly not more than 30 ft. off the ground, dangerously low for such a speed, but the machine came round without a waver and without slipping either up or down, though it was banked almost vertically.

At the end of his second lap he had been in the air 43 min. 42 3/5 sec., so that his second lap took 22 min. 6 sec., the extra 30 sec. probably being lost on the turn, as he had not the preliminary dive which brought him across the starting line so fast the first time.

His time for the full three laps (300 kilometres) was 66 min. 17 1/5 sec., so his last lap took 22 min. 34 3/5 sec. Evidently his engine also was suffering from overheating and he was purposely keeping the speed down, so that his time was governed not by the ultimate speed of his machine but by the speed at which his engine did not boil.

The actual speed at which he covered the whole course works out at 169 miles per hour, which is far from his own record speed over the measured kilometre, and is below what has been done by the Martinsyde and the British Nieuport.

The American Effort.

While MM. Sadi-Lecointe and de Romanet were in the air the Americans started. Mr. Rhinehart went first. His Hall-Scott engine did not sound too well, but it got him off the ground fairly quickly. After getting off he circled round for a while and wound up his undercarriage. Then he came down to the line quite fast, with the engine sounding much better.

After he had been away about 20 min. or less he returned with his wheels down, evidently intending to land. He did so in excellent style and reported that his variable leading edge had jammed so that he could not get the best speed out of his machine. One was also told that he could not recognise the course owing to the restricted view through his windows, and could not hold the machine straight on her course in spite of the little fins which he had fixed on his tail-plane. All of which seem probable and very good reasons for his descent, apart from his speed not being high enough to win.

If he had been able to go on he would at any rate have taken second place. It is a pity he could not, for he and his compatriots deserved some reward for their time, trouble and expense in coming to Europe.

Major Schroeder went next, after a heap of trouble in getting his Packard to start. As he left the ground the knowledgeable Ricketts, Colonel McClean's chauffeur, engineer and general factotum, ex-seaman R.N. and airman R.N.A.S., offered to bet anybody anything that the engine would not last two laps.

As a matter of fact it did not last one lap, for he came back after only a few minutes and made a skilful landing with his big, awkward machine. Later it was learned that, as was expected, the engine refused to keep cool and started pre-igniting after a few miles.

So that was the end of the American effort.

M. de Romanet's Finish.

After that M. de Romanet finished. He crossed the line, turned, and landed downwind at a terrific speed, the machine running hundreds of yards after alighting. The pilot came in smothered in oil and looking like a nigger, but smiling as cheerfully as ever.

His time for the full distance was 1 hr. 39 min. 6 2/5 sec., which, of course, included his stop. At any rate, he had completed the course, which was very much to his credit, for he must have suffered horribly from the hot oil with which he was being soused during the last part of the race.

Mr. Raynham's Attempt.

While all this was going on Mr. Raynham and the British contingent were sitting out on the aerodrome patiently waiting for the sun to go down enough to cool the air, partly to take the bumps out of it and increase the speed, and partly to give the engine a chance of keeping cool. The French thought that he was unable to start, and many people went home after M. Sadi-Lecointe had finished. But, as a matter of fact, his delay was excellent generalship.

Unfortunately, his forethought was of no avail. He went off at about 16.00 hours, in beautiful style, taking less than half the run of any of the others, turned quickly and tore down the course at a pace that made the spectators gasp, looking all over a winner. At the end of 20 min. we all began looking for his return. Minutes passed, and after about 25 min. from the start he came back with his engine misfiring badly. He turned without crossing the line and landed in his usual faultless style.

When he came in he reported that the engine was throwing oil all over the place. Examination showed that there was about a gallon of oil in the engine sump, where there ought to be none at all, and several gallons had evidently been squirted out of the engine into the cowl, whence it had been thrown out over the fuselage and wings.

The Probable Reason.

The probable explanation of Mr. Raynham's stoppage and of M. de Romanet's oil-bath was supplied by Mr. Harry Hawker, who has had a great deal of experience of Hispano-Suiza engines in Sopwith "Dolphins." The Suiza has two oil-pumps, a scavenging pump which sucks the used oil from the sump at the bottom of the crankcase and delivers it to the oil-tank, and a delivery pump which delivers the oil from the tank to the bearings, whence it falls into the sump.

Now, if the engine heats up to past boiling point, all the oil in the engine turns to froth, so that the scavenging pump cannot suck it out of the sump. The result is that all this oil froth is blown out through the breather-pipe of the crankcase. As soon as it reaches the open air it becomes a liquid again and deluges everything within reach.

Naturally the engine, deprived of its lubricant, becomes hotter and hotter. Either pre-ignition occurs or the oil-froth works past the piston-rings and oils up the plugs. In any case, the pilot has to descend.

Mr. Raynham had done the first leg of the course in 10 min. 30 sec., which pace, if he could have kept it up, would have meant beating M. Sadi-Lecointe by at least 3 min., or about 10 kilometres in the 300. Therefore it is not surprising that the engine, flying straight into a very hot sun, should have overheated in the first half-lap.

The radiator had not given any trouble in England, partly because we have not had any hot weather in which to try it to the limit, and partly because the engine was never driven at top speed for more than a short time. In the Aerial Derby Mr. Courtney kept the "Semiquaver" well inside her capacity all the time, and that was the machine's longest flight.

Mr. Hawker said that the Sopwith Company had very similar trouble with the early "Dolphins"—which only had 200-h.p. Suiza engines. This was overcome by putting the oil-tank under the engine and shaping it in with the cowling, so that the slipstream of the airscrew beat directly onto the tank and kept the oil therein so cool that, though it came out of the sump very hot, it was quite cold when it was pumped back into the engine again. This assisted the radiator in keeping the whole engine cool and so the oil never got to the froth stage in which the scavenger pump was unable to deal with it.

One gives this merely as a probable explanation. If it is found on examination of the engine after its return to the Martinsyde works that there was some actual mechanical defect one will make a point of publishing the facts.

Meantime there is some mild satisfaction to be got out of the fact that the "Semiquaver" herself proved that Martinsyde products at least the equal of the world's best. The race did not necessarily go to the best machine, for nobody knows yet whether the Martinsyde or the Nieuport is actually the faster. It was decided simply by which engine could be kept the cooler. Personally, one is inclined to think that M. Lamblin really won the race.

A Contributory Cause.

Another possible explanation of the overheating, or at any rate a contributory cause, was the petrol used. Mr. Perrin, of the Royal Aero Club, had made arrangements for petrol to be delivered at Etampes for Mr. Raynham's use. For some unexplained reason the firm concerned did not get its instructions through to France in time. Consequently Colonel Bristow, of Ogilvie and Partners, the well-known aeronautical consulting engineers and surveyors, who was in Paris at the time, had to send a man with a lorry from Paris to Rouen—the only place where aviation petrol could be got—and thence to Etampes with the necessary *essence*.

This turned out to have a specific gravity of about 0.680, whereas the "Semiquaver's" carburetter was tuned for something over 0.700. And, according to those who know about such things, the lighter spirit would certainly raise the temperature of the engine unless the carburetter was adjusted to suit or unless benzol was added to raise the specific gravity.

It seemed too risky to play with the carburetter, and benzol could not be got. So that was that.

Finally.

After Mr. Raynham's descent there was nothing left to do except congratulate M. Sadi-Lecointe on his victory, which, as a thorough sportsman and a skilful pilot, he well deserved. Some of the French spectators seemed rather surprised at the heartiness of the British congratulations, but they did not know of the friendly relations between M. Sadi-Lecointe's *entourage* and Mr. Raynham's.

That being done, we all went home, sadder and wiser, but feeling at any rate that it had been a very pleasant holiday for most of us. The pleasure of the visit was due entirely to the good nature and hospitality of Colonel McClean and Mr. Hurst, who seemed to think that their mission in life was to be completely at the service of every British visitor who happened to arrive. On behalf of all such visitors one tenders them a unanimous vote of thanks.

Personally, one wishes also to acknowledge one's indebtedness to Handley Page Transport, Ltd., for conveying oneself and "Herself" to Paris and back in the most comfortable manner possible. No more railways and boats so long as it is possible to go by air at a reasonable price.

Also, one desires to thank those two excellent pilots, Messrs. Capps and Rogers, not so much for conveying us there and back safely—for that is only what one expects of pilots of their ability—but for doing under the varying circumstances of the voyage just what one hoped they would do. Each pilot has his own notions of navigation—as Mr. Kipling foretold in "With the Night Mail"—and it is most comforting when the passenger and pilot have the same notions. But that is another story, concerned with Civil Aerial Transport, on which one hopes to discourse at a later date.—C. G. G.

THE AIR MINISTRY COMPETITION RESULTS.

Below will be found the official notification concerning the aeroplane trials at Martlesham during August last.

While one agrees with the Judges to the extent that the amount of progress shown in the number of entries received was hardly so great as to warrant the giving of the full amount of prize money, one states most emphatically that the Judges have done a very grievous injury to the British Aircraft Industry by withholding the first prize in the large aeroplane class and only allocating the second prize to the winner.

It is obvious that the "W.8" Handley Page and the Commercial Vickers "Vimy," both of which existed a year ago, can scarcely be said to represent the last word in progress to-day. None the less it remains an undeniable fact that they are first-class aeroplanes, and far in front of anything produced in any foreign country. Therefore it was extraordinarily bad policy to state officially that neither of them is worthy of a first prize, quite apart from the fact that it is difficult to see how, logically, two of anything can be second and third out of only two competitors.

That is the worst of these committees composed of high-class scientists. Any ordinary individual would merely have said that the two machines were respectively first and second, but that the amount of prize money was reduced in view of the smallness of the entries. One feels sure that the Judges themselves, who are the keenest possible believers in the progress of aviation, besides being individually the kindest and most charming of men, did not duly consider the fact that by withholding the first prize, and giving the second prize only to the winner, they thereby labelled the best of our twin-engined machines as being merely second class.

The result must be that when French or German aeroplane salesmen come to sell "Goliaths" or "Gothas" to the various new nations they will be able to produce the dictum of the Air Ministry Judges in support of their assertion that whereas their own machines are undoubtedly first class, the best British machines are stamped as second and third class aeroplanes by the British Air Ministry. The only consolation seems to be that it will be the French and Germans who will receive the stumer cheques.

It seems that the Air Ministry should take immediate steps to counteract any such impression. What these steps had better be one leaves to the brains of the Air Ministry. Having done the trade this grave injury it is up to the Air Ministry to make amends, for as the matter stands at present there is a little too much justification for the cynic who referred to the Department of Civil Aviation as the "Anti-Aircraft Department."

The official announcement reads as follows :—

LARGE AND SMALL AEROPLANE AWARDS.

The Air Ministry announced on Oct. 2nd, 1920 :—

The Judges' Committee consider that the results of the Competitions for aeroplanes show collectively less radical advance in general design than had been anticipated, and that though very useful developments in detail design have been produced, which in themselves have justified the Competitions, the award of the full prizes originally specified is not warranted. The following sums have therefore been awarded :—

(A)—Large Aeroplane Class.

First Prize.—Not awarded.

Second Prize.—Messrs. Handley Page Transport, Ltd., H.P. W8, fitted with two 450-h.p. Napier "Lion" engines—£8,000.

Third Prize.—Messrs. Vickers Limited, Vickers "Vimy" Commercial, fitted with two 350-h.p. Rolls-Royce "Eagle 8" engines—£4,000.

(B)—Small Aeroplane Class.

First Prize.—Messrs. Westland Aircraft Works, Westland "6-Seater," fitted with 450-h.p. Napier "Lion" engine—£7,500.

Second Prize.—Messrs. Sopwith Aviation and Engineering Co., Ltd., Sopwith "Antelope," fitted with 180-h.p. Wolseley Hispano "Viper" engine—£3,000

Third Prize.—Messrs. Austin Motor Co., Ltd., Austin "Kestrel," fitted with 160-h.p. Beardmore engine—£1,500.

A further announcement will shortly be made regarding the results of the Competition for Seaplanes (Amphibians), followed in due course by a full technical report upon the whole of the Competitions.

THE DE HAVILLAND AIRCRAFT COMPANY.

In the list of new companies registered, which will be found in its proper place in the Aeronautical Engineering Supplement, is the registration of the De Havilland Aircraft Company, Limited.

It will be remembered that the formation of a new aircraft concern by Captain Geoffrey de Havilland was foretold in The Aeroplane some weeks ago, and it is satisfactory to see this prophesy now confirmed.

The names of the directors of the new firm are very decidedly interesting. Captain de Havilland himself is already well known as one of the half-dozen greatest aeroplane designers in the World. The wonderful war record of the D.H. machines is still fresh in everybody's memory, and the peace performances of the D.H.16s and 18s have demonstrated that Captain de Havilland's brain can be of as great a service in the future of aviation as it has been in the past.

Mr. A. E. Turner was before the war in charge of aircraft contracts at the War Office, where he came in contact with aviation owing to the fact that all contracts for the Army's first aeroplanes passed through his hands. From the War Office he went to the Air Board when that body was given administrative power, and thence he went to the Aircraft Manufacturing Company, Limited, as a director.

Mr. Turner has an excellent record as a practical financier, that is to say, one who is able to handle commercial finance, cost of production, and so forth, in a thoroughly sound manner as distinct from the financial methods of the company promoter.

Mr. C. C. Walker, the third director of the firm, was for a long time Mr. de Havilland's right-hand man in the Design Department of the Aircraft Manufacturing Company. Though one cannot pretend to know how their respective jobs were allocated, it was generally understood in the Aircraft Industry that Mr. Walker was chief of the firm's Technical Department, and was by way of being an aero-dynamic genius. The fact remains that the combination worked excellently, and therefore their continued co-operation in the De Havilland Aircraft Company, Limited, is the best possible guarantee of success in the future.

Besides the three Directors the de Havilland Co. includes Mr. Hearle, who was chief of the experimental department of the Airco on the constructional side. He worked with Capt. de Havilland on his first machine some nine years ago. Also there is Mr. Hagg, who was chief of the Airco design drawing office for some years, and Mr. St. Barbe, who is business manager of the new firm, and was with the Airco before the war. Thus it would appear that Capt. de Havilland has collected the pick of his old associates at the Aircraft Mfg. Co.

As regards the firm's policy, one does not expect to see it blossom forth into the organisation of aircraft output on a quantity-production basis. One is rather under the impression that the intention of the firm is to start operations with the care and maintenance of existing aeroplanes belonging to existing transport lines. If this is the intention, the logical result would be the production from time to time of new types of civil aerial transport machines for those lines, the said designs being based on soundness and cheapness of construction.

This surmise is based on the fact that for some time Captain de Havilland and Mr. Walker have been engaged on the design of a big passenger-carrying monoplane, with cantilever

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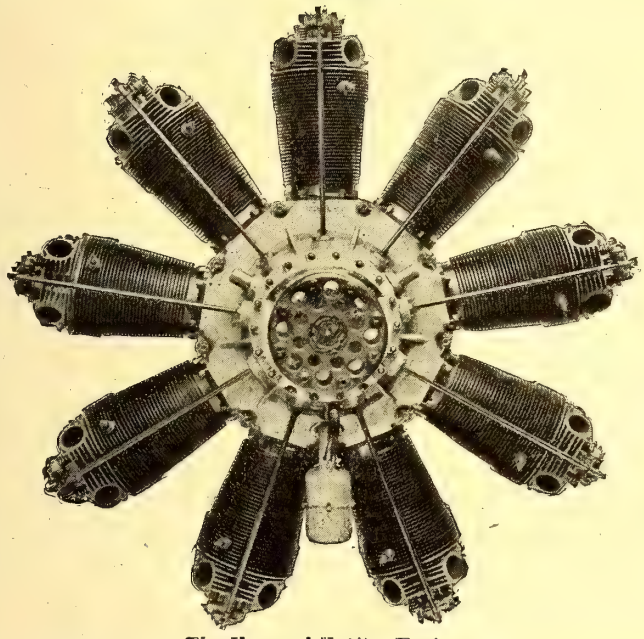
"Bristol"

400 h.p. JUPITER AERO ENGINE.



The Ungeared Jupiter Engine.

Ungeared type weighing 698 lbs.
Geared type weighing 805 lbs.

Important patents are incorporated in these types, and the reduction in weight per H.P. effected has never previously been attained in any other engine. Illustrated and descriptive details will be sent to those interested.

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"high-lift" wings, which is intended to carry six passengers and pilot with a 240 h.p. Siddeley "Puma" engine at a cruising speed of 100 miles an hour. One has known of the existence of this design for a considerable time, but has been obliged to refrain from mentioning it until the company was properly constituted, for there is nothing which Captain de Havilland likes less than that anyone should make for him promises which he is not sure of fulfilling.

Those who have read Captain W. H. Sayers' articles on high-lift wings and efficiency in this paper have known for a long time that it is possible to lift many more passengers and much greater loads at far less cost than we expend at present. It is apparently being left to Captain de Havilland to demonstrate the fact in practice. One hopes, therefore, to see his new monoplane doing its trials before very long, for its success will do much to advance the progress of Civil Aviation towards the next boom in the Aircraft Industry.

Aerial transport should be by rights the cheapest as well as the quickest form of locomotion, and one hopes to see the de Havilland Aircraft Company go far towards proving this statement. Undoubtedly Captain de Havilland will compete for any Air Ministry orders which may be put out for tender and competition from time to time, but one is under the impression that the firm's first interests will be in the direction of developing aircraft for Civil Aviation.

Whatever may be the firm's plans, it is eminently satisfactory that the experience of these three Directors is again available for the progress of aviation, and, needless to say, everybody in the aeronautical community will wish the firm all possible success.—C. G. G.

COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

All Official Notices are held over until next week.

CONTINENTAL ARRIVALS AND DEPARTURES.

[*The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.*]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; C.A.C.—Central Aircraft Company; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijkie Luchtvaart Maatschappij.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

(Compiled by the Staff of The Aeroplane.*)*

SEPTEMBER 27th:

A.P.B., Westland, G-EAJL, London-Paris, 10.45-13.05, G., 2, Powell.
A.T.&T., DH9, G-EAOZ, London-Paris, 10.45-13.10, G.&M., 1, Milnes.
A.T.&T., DH16, G-EASW, London-Amsterdam, 10.50-14.23, G., Nil, Robbins.
M.A., Breguet, F-CMAF, London-Paris, 12.05-14.30, Nil, Nil, Le Men.
I.A.L., Vimy, G-EASI, London-Paris, 13.25-16.00, Nil, 3, Barnard.
A.T.&T., DH16, G-EAQS, London-Paris, 16.35—, G.&M., 2, Armstrong.
C.T., Nieuport, F-CGTY, Paris-London, 13.50-17.16, M., Nil, Le Comte.
C.desG.E.A., Goliath, F-GEAD, Paris-London, 15.25-18.25, G., Nil, Le Bouchere.
A.T.&T., DH16, G-EALM, Paris-London, 15.55-18.25, G., Nil, Holmes.
A.T.&T., DH9, G-EAOZ, Paris-London, 16.00-18.45, Nil, Nil, Milnes.

SEPTEMBER 28th:

A.T.&T., DH9, G-EAOZ, London-Paris, 11.40-14.15, G.&M., Nil, Forson.
A.T.&T., DH9, G-EAGY, London-Amsterdam, 11.50-16.45, G., Nil, Carter.
C.T., Nieuport, F-CGTY, London-Paris, 16.00-18.20, Nil, Nil, Le Comte.
A.T.&T., DH9, G-EAQL, London-Paris, 16.30-18.50, G.&M., 1, Tebbitt.
A.P.B., Westland, G-EAMV, Paris-London, 13.00-15.10, Nil, 2, Powell.
M.A., Breguet, F-CMAG, Paris-London, 13.20-15.42, G.&M., Nil, Challaux.
I.A.L., Vimy, G-EASI, Paris-London, 13.30-16.00, G., Nil, Barnard.
A.T.&T., DH16, G-EAPT, Paris-London, 14.05-16.25, Nil, 4, Reeves.
A.T.&T., DH9, G-EAPL, Paris-London, 14.15-16.25, G., 1, Bamber.
A.P.B., Westland, G-EAJL, Paris-London, 15.20-17.30, Nil, 3, Courtney.
A.T.&T., DH16, G-EAQS, Paris-London, 16.00-17.40, Nil, 4, Armstrong.
A.T.&T., DH16, G-EASW, Amsterdam-London, 15.15-17.30, G.&M., Nil, Robbins.

SEPTEMBER 29th:

A.P.B., Westland, G-EAMV, London-Paris, 11.15-16.15, G., 2, Powell.
A.T.&T., DH16, G-EAQS, London-Paris, 11.40-16.15, G.&M., 2, Reeves.
A.T.&T., DH16, G-EASW, London-Amsterdam, 11.35—, G., Nil, Milnes.
M.A., Breguet, F-CMAG, London-Paris, 14.20-17.35, G., Nil, Challaux.
C.desG.E.A., Goliath, F-GEAD, London-Paris, 14.24-17.45, Nil, Nil, Le Bouchere.
A.T.&T., DH16, G-EAPT, London-Paris, 16.10-19.00, G.&M., 2, Armstrong.
A.T.&T., DH9, G-EAPT, Lympne-London, 09.53-10.30, Nil, Nil, Lines.
C.T., Nieuport, F-CGTU, Paris-London, 12.50-15.40, M., Nil, Petit.
A.T.&T., DH9, G-EAOZ, Paris-London, 12.50-15.44, G., Nil, Forson.
M.A., Breguet, F.CMAF, Paris-London, 13.55-16.17, G., Nil, Le Men.
A.T.&T., DH9, G-EAQL, Paris-London, 15.55-18.00, G., 1, Tebbitt.
A.T.&T., DH9, G-EAGY, Amsterdam-London, 14.32-17.52, G&M, 1, Carter

SEPTEMBER 30th:

A.T.&T., DH9, G-EAOZ, London-Paris, 10.28-13.15, G.&M., Nil, Robbins
A.T.&T., DH9, G-EAGY, London-Amsterdam, 10.29-17.08, G., Nil, Bamber
M.A., Breguet, F-CMAF, London-Paris, 12.40-15.30, Nil, Nil, Le Men
I.A.L., Vimy, G-EASI, London-Paris, 12.50-16.05, G., 1, Chattaway.
A.T.&T., DH16, G-EALM, London-Paris, 15.50-18.37, G., 4, Lines.
A.T.&T., DH9, G-FAPL, London-Paris, 15.45-18.25, G.&M., 1, Tebbitt.
M.A., Spad, F-CMAW, Paris-London, 13.17-15.06, G., 1, Bamber.
A.T.&T., DH16, G-EAPT, Paris-London, 13.35-15.30, G., Nil, Reeves.
A.T.&T., DH16, G-EAQS, Paris-London, 15.45-17.30, G., 4, Armstrong.
K.L.M., Fokker, H-NARD, Amsterdam-London, —18.50, Nil, 2, Hinchliffe
A.T.&T., DH16, G-EASW, Amsterdam-London, 15.00-18.45, G.&M., Nil, Milnes.

OCTOBER 1st:

A.T.T., DH18, G-EAUF, London-Paris, 10.12-13.05, G.&M., 6, Forson.
A.T.T., DH16, G-EAPT, London-Amsterdam, 10.15-12.10, G., 1, Carter.
A.T.T., DH16, G-EAQS, London-Paris, 15.55-18.15, G.&M., 3, Reeves.
M.A., Spad, F-CMAW, London-Paris, 16.00-18.32, Nil, 1, Bourdon.
A.T.T., DH16, G-EALM, Paris-London, 10.30-12.55, G., 1, Robbins.
I.A.L., Vimy, G-EASI, Paris-London, 12.00-15.30, Nil, Nil, Chattaway.
C.desG.E.A., Goliath, F-GEAB, Paris Lympne, 14.15-16.10, G., Nil, Paten.
A.P.B., Westland, G-EAMV, Paris-London, 15.20-17.10, Nil, 1, Powell.
A.T.T., DH18, G-EAUF, Paris-Lympne, 15.25-16.51, G.&M., 6, Forson.
A.T.T., DH9, G-EAGY, Amsterdam-Lympne, 14.17-17.35, G.&M., 1, Bamber.

OCTOBER 2nd:

A.T.T., DH9, G-EAPU, London-Paris, 10.05-12.45, G.&M., 1, Armstrong.
A.T.T., DH16, G-EASW, London-Amsterdam, 10.30-12.47, G., Nil, Milnes.
A.P.B., Westland, G-EAJL, London-Paris, 10.30-13.20, G., Nil, McMullin.
A.T.T., DH16, G-EALM, London-Paris, 15.45-18.15, G.&M., 3, Robbins.
A.T.T., DH18, G-EAUF, Lympne-London, 09.52-10.30, Nil, Nil, Forson.
A.T.T., DH9, G-EAGY, Lympne-London, 10.12-10.52, Nil, Nil, Bamber.
A.T.T., DH16, G-EASQ, Paris-London, 10.35-12.20, G., 2, Tebbitt.
C.desG.E.A., Goliath, F-GEAB, Lympne-London, 10.52-11.45, G., Nil, Paten.
M.A., Breguet, F-CMAI, Paris-London, 13.10-15.30, G.&M., Nil, Martel.
A.T.T., DH9, G-EAPL, Paris-London, 15.40-18.00, G., Nil, Lines.
A.T.T., DH16, G-EAPT, Amsterdam-London, 14.40-19.08, G.&M., 2, Carter.

OCTOBER 3rd:

A.T.T., DH9, G-EAQP, London-Paris, 09.20-12.00, Nil, 2, Forson.
C.desG.E.A., Goliath, F-GEAB, London-Paris, 10.47-15.30, G., Nil, Paten.
A.T.T., DH9, G-EAPU, Paris-London, 10.20-12.10, Nil, 2, Armstrong.
A.T.T., DH9, G-EAOZ, Paris-London, 10.20-12.10, Nil, 1, Reeves.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

(Compiled from Log of Cricklewood Aerodrome. Times on the Continent from Air Ministry Communiqués.)

SEPTEMBER 27th:

H.P.T., HP, G-EATN, London-Paris, 12.14-15.25, G., 7, Bager & 1.
H.P.T., DH9, G-EAUN, London-Brussels, 14.35-17.00, G.&M., Nil, Olley.
H.P.T., DH9, G-EATA, London-Amsterdam, 14.35-17.00, G.&M., 1, Wilcockson.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 11.55-15.35, M., 2, Foot.
H.P.T., HP, G-EATK, Paris-London, 13.15-16.50, G., 7, McN. Davies & 1.
S.N.E.T.A., DH4, O-BABI, Brussels-London, —18.45, G., Nil, Briere.
H.P.T., DH9, G-EAUC, Amsterdam-London, 14.40-19.15, Nil, 2, Moore.

SEPTEMBER 28th:

H.P.T., HP, G-EALX, London-Paris, 12.30-16.05, G., 9, Rogers & 1.
H.P.T., DH9, G-EATA, Amsterdam-London, 09.12-14.00, G.&M., 1, Wilcockson.
S.N.E.T.A., DH4, O-BABI, London-Brussels, 15.40—, G.&M., 1, Briere.
H.P.T., DH9, G-EAUC, London-Amsterdam, 14.55—, G.&M., 1, Moore.
H.P.T., HP, G-EATJ, Paris-London, 12.30-15.30, Nil, 4, Halliwell & 1.
H.P.T., DH9, G-EATA, London-Brussels, 15.46—, Nil, 1, Fowler.
H.P.T., DH9, G-EAUP, Brussels-London, 14.40-17.15, M., 1, Hill.

SEPTEMBER 29th:

H.P.T., HP, G-EASY, London-Paris, 12.16-16.00, G., 7, Beal & 1.
H.P.T., DH9, G-EAUC, Amsterdam-London, 08.32-12.35, M., Nil, Moore.
H.P.T., HP, G-EASN, London-Brussels, 14.42-18.50, G.M., 3, Halliwell & 1
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.56—, G.&M., Nil, Foot.
H.P.T., HP, G-EATM, Paris-London, 12.30-15.40, Nil, 6, Capps & 1.
H.P.T., HP, G-EALX, Paris-London, 12.40-15.42, Nil, 8, Bager & 1.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 14.35-17.30, G.M., 1, Rigaud

SEPTEMBER 30th:

H.P.T., HP, G-EATH, London-Paris, 12.17-16.35, G., 5, McN. Davies & 1.
H.P.T., HP, G-EATN, Paris-London, 12.55-15.22, G., 4, Rogers & 1.
H.P.T., DH9, G-EATA, Brussels-London, 14.35-16.52, M., Nil, Fowler.

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H.P.T., HP, G-EASN, Brussels-London, 14.15-17.07, Nil, Nil, Halliwell & 1
H.P.T., DH4a, G-EAVL, Amsterdam-London, 15.07-18.30, G.M., Nil, Foot

OCTOBER 1st:

H.P.T., HP, G-EATG, London-Paris, 12.15-17.00, G., 5, Olley & 1.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.50—, G.&M., Nil, Foot.
H.P.T., DH9, G-EAUP, London-Brussels, 14.55-17.35, G.M., 2, Wilcockson
H.P.T., HP, G-EASY, Paris-London, 12.45-15.40, G., 6, Beal & 1.
H.P., DH4, O-19, London-Brussels, 15.10-11.45 (2nd), Nil, 1, Halliwell.
H.P.T., DH9, G-EAUC, Amsterdam-London, 11.40-16.05, M., Nil, Moore.

OCTOBER 2nd:

H.P.T., HP, G-EATJ, London-Paris, 12.12-16.35, G., 9, Bager & 1.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 15.05(1st)10.45, G., 1, Rigaud
S.N.E.T.A., DH4, O-BALO, London-Brussels, 14.46-17.35, G.M. Nil, Rigaud
H.P.T., HP, G-EATH, Paris-London, 12.55-16.00, Nil, 2, McN. Davies & 1
H.P.T., DH9, G-EAUP, Brussels-London, 14.45-17.10, M., 1, Wilcockson.

OCTOBER 3rd:

H.P.T., HP, G-EATG, Paris-London, 12.15-15.10, Nil, 1, Olley & 1.

Inland Flying at Croydon.

Sept. 27th.—Beardmore test.
Sept. 28th.—Nil.
Sept. 29th.—A.T. & T., D.H.9 test, D.H.9, two joy-rides, and D.H.16, test.
Sept. 30th.—A.T. & T., D.H.9 six joy-rides, D.H.9 two tests, D.H.16 one test.
Oct. 1st.—A.P.B. Westland two tests; K.L.M. Fokker test.
Oct. 2nd.—A.T. & T. DH9 test; A.P.B. Westland test; K.L.M. Fokker to Cricklewood; I.A.L. Bat from Northolt; Holmes and Jones Avro test.
Oct 3rd.—I.A.L. "Vimy" two joy-rides.

Inland Flying at Cricklewood.

Sept. 27th.—H.P.T. H.P. test.
Sept. 28th.—H.P. D.H.4 two tests; H.P.T. H.P. test.
Sept. 29th.—H.P.T. H.P. test
Sept. 30th.—H.P.T. H.P.w8 test; Aircraft Disposal Co. D.H.9 from Farnboro', Bristol, Farnboro' return.
Oct. 1st.—H.P. two D.H.4s three tests; H.P.T. D.H.9 test.
Oct. 2nd.—H.P.T. two D.H.9s to Hamble and Aintree; I.A.L. Bat from Northolt, then to Croydon; K.L.M. Fokker from Croydon.
Oct. 3rd.—D.H.9 from Aintree.

London Terminal Aerodrome.

Everybody is looking forward to the Paris and back race for "Fat Porters" next Sunday, Croydon being the turning point. There should be a big attendance for Croydon's first sporting event, especially as admission is free.

The event of the week was the arrival of the 185-h.p. Fokker six-seater monoplane. Having been duly announced in the general Press that the machine would be at Croydon during the week-end for exhibition purposes, Mr. Hinchliffe promptly took it to Cricklewood, where it remained during Saturday and Sunday.

The Instone Air Line have at last received the "Bat." The fuselage and struts are now painted Royal blue, giving the machine a very fine appearance. Mr. Barnard was up on the "Vimy" with a full load on Sunday in atrocious weather. He likened his sensation in controlling the "Vimy" under these conditions to "fighting with a bear." Afterwards he took the machine up light and climbed her steeply into the wind so that his ground speed was just equal to the wind speed. The consequence was that the machine stayed over one spot and ascended like a lift. Finally he pulled off quite the nicest "three-point landing" one has yet seen.

A.T. and T. still maintain easily their position at Croydon as the premier air line, machines coming in and going out several times daily with the regularity of clockwork.

Air Post of Banks are going strong, and on the worst day last week Mr. Courtney was one of the few pilots to complete the journey to time.

An Avro belonging to Messrs. Holmes and Jones, who have been running a joy-ride concern in the provinces, has arrived.

THE LONDON TERMINAL AERODROME FROM A WOMAN'S POINT OF VIEW.

If you have ever been in the W.R.A.F. or have even less excuse for cultivating a most unfeminine love of aeroplanes, you can spend an extraordinarily happy Sunday afternoon at the Waddon Aerodrome, Croydon. If you are poor but persevering you can get out there by train, tram and finally human motive power, and once there you don't really care if you never get back to streets and houses again.

Big black and white boards stare at you from a dozen different angles in almost as many languages. A smaller and more friendly looking board tells you that you may come and look at the pretty aeroplanes if you don't touch or even go outside the pen.

An extraordinary number accept this invitation every Sunday afternoon, and stand for hours at a time crushed hard against a blackthorn hedge watching the antics of a stout air liner for whom most of them have achieved an almost personal affection. There is no need to be lonely at Croydon; if you want to know things plenty of people will assist you with amazing pieces of information from inside the pen; and if you are seeking really reliable information, there are relays of affable people with red bands on their arms who will tell you anything from the number of split pins used in the construction of the "Vimy" to the number of cocktails any pilots can consume a minute.

If you can persuade an official or "unofficial" to escort you past the policeman and into the sheds your day attains a completeness not found in the pen alone. A truly wonderful variety of machines meet your gaze, from the massive lines of the "Eighteen," with its drunken-looking three-blader perched on its nose, to the familiar Avro with its second control removed from the temptation of inquisitive passengers. Beautiful to look upon, and to travel in, is the "Bat," all blue and black and silver, and a jolly little cabin, but what a lonely place for the pilot!—C. S. H.

THE FUTILITY OF THE LAY PRESS.

In the daily Press last week, under such headings as "Seaplane'S 'orrible Sideslip,' or "Seaplane's Nose-Dive into the Medway," or words to that effect, a graphic description was given describing how in an awful accident Major Gnosspelius, Mr. Cotton and Mr. Ronald Kemp nearly came to an untimely end in a Short "Shrimp."

Actually what happened was that on Sept. 23rd last (or thereabouts) Mr. Kemp took up Major Gnosspelius and Mr. Cotton on a Short "Shrimp," and alighted with a certain amount of drift. The undercarriage was damaged and one float became submerged. The machine was then towed into the works, sustaining some damage in the process. Far from being hurt, none of the occupants was even wetted.—G. D

THE ROYAL AERO CLUB.

FRENCH AIR RACE.

Paris—London—Paris, Sunday, Oct. 10th, 1920.

In connection with the Buc Aviation Meeting on Oct. 8th, 9th, and 10th, 1920, there is to be a race for French transport machines on the Paris-London route on Sunday, Oct. 10th, 1920. The machines will leave Buc Aerodrome, Paris, and alight at Waddon Aerodrome, Croydon, and return immediately to Paris.

The following is an extract from the Regulations:—

"Machines must conform to the following conditions:—

"Postal machines (machines carrying postal bags only) to carry a load of at least 50 kg

"Transport machines to carry a minimum of two passengers in addition to the crew; the passengers must be at least 18 years of age. On the outward journey the passengers must be on board; on the return journey each passenger may be replaced by 100 kg. of ballast. In the case of machines of 500 h.p. or more, the crew must consist of at least two persons."

The following is the list of entries:—

Entrant.—Grands Express Aeriens. *Pilot.*—Favereau or Patin. *Machine.*—F.60. *Motor.*—Two Salmson 260 h.p.
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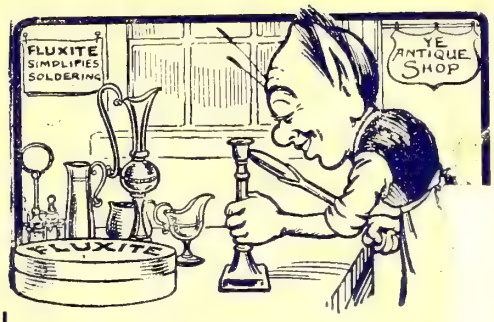

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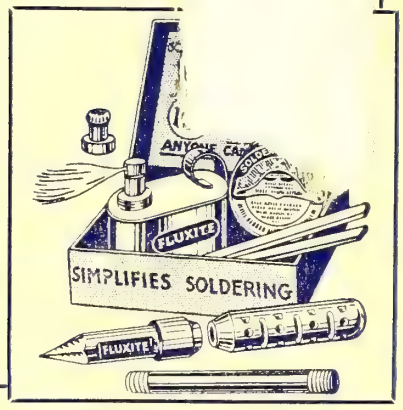

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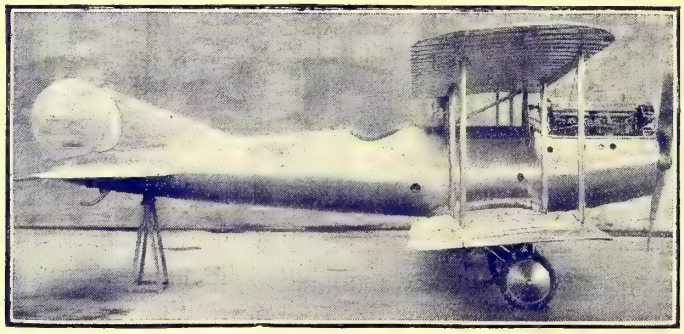

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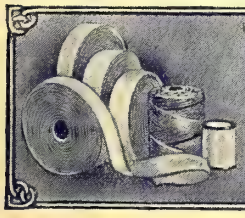

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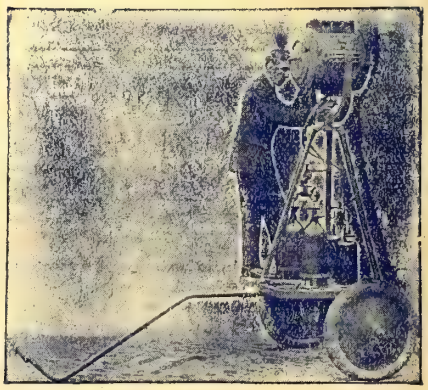

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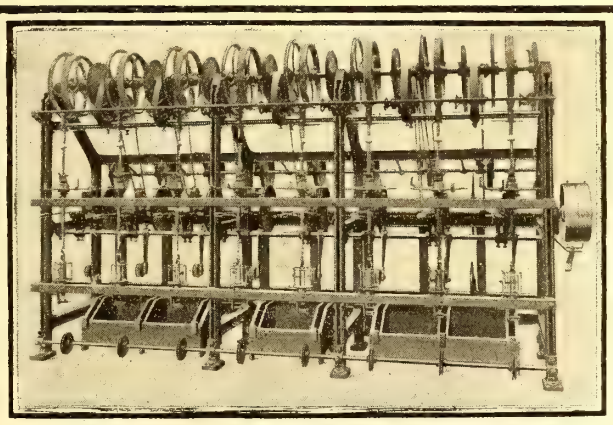

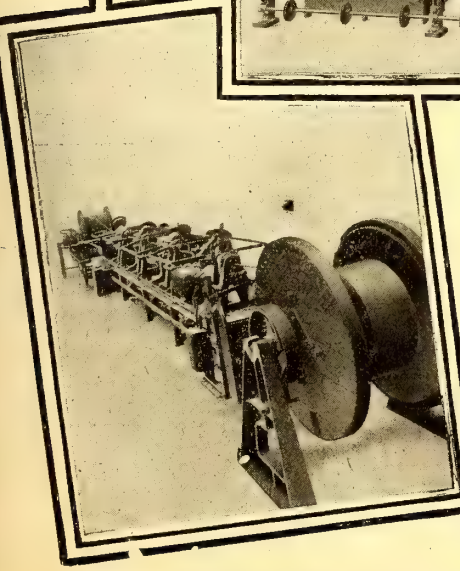

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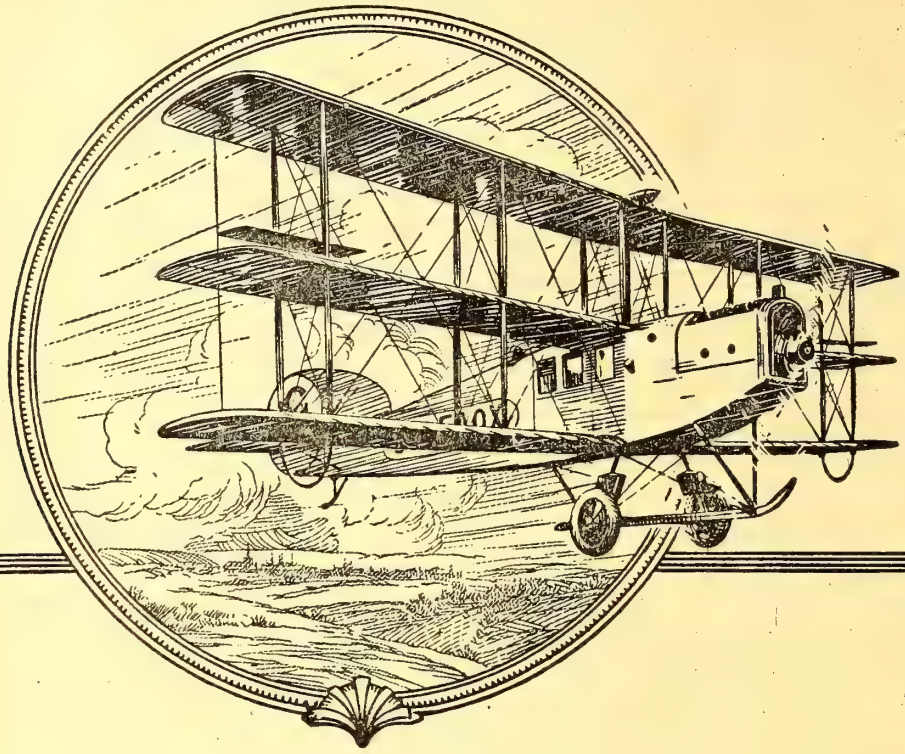

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ON THE NEEDS OF CIVIL AVIATION.

By the time these notes appear the much advertised Air Conference at the Guildhall will be in full blast. The intention of the Air Ministry in organising this Conference is excellent, but it will be impossible to tell for some months whether any good effect will have been produced or whether the Air Ministry will have merely added another weighty contribution to the proverbial Great Pavement. It is at any rate certain that the time chosen for the Conference is not the best possible, and that by sheer bad luck circumstances such as the prevailing industrial unrest have made the time less opportune than it would have been if everything else had been well.

Therefore the aeronautical community had better regard the Conference in the philosophic state of mind of him who said, "Blessed are they who expect little for they shall not be disappointed." If the Conference has any good effect, so much the better. We shall all be grateful to the Air Ministry for its good work. If the Conference has no effect, we are all prepared to take the will for the deed and to be grateful to the Air Ministry for doing its best.

At the same time one cannot help pointing out that the Conference would certainly have had more effect if it had been held in conjunction with the Aero Show at Olympia in July. A year before that, one "Medway," a writer who is not only brilliant as a writer but who has in fact proved himself to be one of the cleverest and most effective organisers in this country, set forth chapter and verse in this paper for an Aeronautical Conference on lines which would have certainly done very much to save the Aircraft Industry from reaching its present low ebb. Naturally, as he merely wrote on the subject and did not go to the trouble of pulling official and commercial strings—being in fact only interested in aviation as a sympathetic spectator—his sound advice was ignored, and a magnificent opportunity was lost.

It is to be hoped that the present Conference will do something towards regaining that lost opportunity. But if at any future date either the Air Ministry or the Society of British Aircraft Constructors, encouraged by such success as the present Conference may achieve, is thinking of organising another on a most extensive scale, one will be pleased to put them in touch with this "Medway." One can at any rate promise that he will give them many new and original ideas on the subject of organising conferences, and that he will secure the attention of the Press—which the Air Ministry seems to be so keen on acquiring—without putting up the species of silly "stunt" which seems to be the only thing which interests our newspaper editors in connection with Aviation.

What the Press Does and Might Do.

Undoubtedly one of the needs of Civil Aviation is attention of the right kind in the Press, for people still read newspapers although it is now customary to discount heavily any statement which appears in print. No longer do even the most ignorant and credulous say, "It must be true, because I saw it in the paper." Thanks to the success of the modern journalist in blaspheming his art, the public of to-day say, "The paper says so-and-so. I wonder what are the facts."

Yet there are certain sections of every paper which are accepted as truthful. For example, nobody thinks of questioning the football results, betting odds, Stock Exchange quotations, reports of golf matches, solutions of chess problems, or any such really important matters of life. Now if only the newspapers could be induced to publish aviation news on the same footing as these other vital affairs, the public would undoubtedly be persuaded to believe in aviation.

One finds in the Press a marvellous account of how a famous designer hopes some day to produce a machine consisting entirely of wings; passengers, goods, engines, and everything all inside the wings, no body or tail, or anything of that sort—though incidentally the famous designer denies any intention of doing anything of the kind. But one fails to find any reference to the daily arrivals and departures at and from the Air Ports of Croydon and Cricklewood of dozens of passengers in existing machines of that same famous designer's production.

The public accept the apocryphal aeroplane for precisely what it is worth. The account merely wastes paper, it does no harm and no good to aviation. But if that same paper published day by day the arrivals and departures of aircraft just as it chronicles the arrival and departure of shipping, and if it published those arrivals and departures as a matter of course, with but after its shipping news, then it would do real good to aviation, for the commercial community which reads the shipping news would perforce accept the aircraft arrivals and departures as a part of the nation's transport system, and would in due course use that method of transport.

Similarly, the accounts of dances in aeroplane saloons, alleged to be in the air when in fact the photographs were taken on the ground, and the posturing mummers returned to London without having left the ground; the vivid descriptions of how pigs flew to France; the glorified and gorified accounts of every little aeroplane accident, and so forth, all bring aviation into contempt and disrepute, and tend to put it on the level of the kinematograph trade. If the Press would ignore all "stunts" and would merely report progress from time to time in dull but credible articles it would do real good.

How to Reach the Business Man.

Those who are concerned with and for the progress of aviation have no desire to tickle the ears (or eyes) of the groundlings. They want to impress the dull and respectable business man, for he is the man whose money is wanted for future development.

And they want his money not as a speculator in aircraft shares, but first of all as a customer sending his letters and goods by air line, later as a passenger by air, and later as an investor in aerial transport com-

panies. The long-haired imitation "knut," and the short-skirted "bird," who look at the cheap illustrated papers and are unable to read, are no use to aviation. The person we all want to interest is the commercial man with a goodly paunch and a heavy gold watch-chain across it. When he can read his aviation news among his other commercial news, and not among the "snappy stunt pars," then and not till then will commercial aviation be taken seriously.

To achieve this end the Press must be converted in the right way. As one of the few intelligent men of one's very limited acquaintanceship among the newspaper species remarked recently, "What the Civil Aviation people and the Trade ought to do is to get hold of the *editors* of the big papers and convert *them* to a belief in aviation. It is no use wasting time on a lot of hooligan reporters."

There you have the essence of the whole question. The truth is that the editors themselves do not believe in aviation. They know that their "hooligan reporters" have more imagination than sense or understanding, they regard their reports as faked or "inspired," and they discount them accordingly. But, if the Department of Civil Aviation or the Society of British Aircraft Constructors can get hold of the actual editor-in-chief of each paper and induce him to devote an hour or so to informing himself on the progress of aviation, then we shall achieve results in a few months far greater than we shall achieve in years under existing circumstances.

If the editor in each case knew what is actually being done in aerial transport to-day he would see to it that aviation was treated in the dull and respectable way which impresses the business man and would cease to allow his ignorant sub-editors and hooligan reporters to treat it purely as a subject for sensationalism.

For example, last week seven of our leading London papers devoted between them thirty-five inches to the liquidation of the Sopwith Company, emphasising the fact that it was the failure of an aircraft firm and carefully omitting to emphasise the fact that the failure was caused by dabbling in motor-bicycles, a game it did not understand. But none of the seven gave any space to recording the encouraging side of commercial aviation.

What Is Doing in the Aircraft Industry.

As a matter of fact, considering all things, the Aircraft Industry is doing very well at present, and its future seems most encouraging. There is, for example, the formation of the new de Havilland Aircraft Company, a concern which has orders in hand, and is absolutely certain of future orders, for no sane Air Ministry is going to lose the services of Captain de Havilland and his staff, apart from the fact that his and Mr. Walker's new commercial designs are certain of success.

There is the interesting fact that at least one aircraft firm—which must be nameless—is so busy on Government orders that its aircraft department cannot handle them and it is forced to sub-contract much of its work. There is another firm quite busy on orders for one of our Colonies, and another busy on orders for foreign Powers. And yet another has goodly contracts in hand for the Air Ministry.

There are several improvements in wings now on the point of production, in addition to the Handley Page and the "Alula," which will enable designers to get better value out of the engine-power expended, which means cheapening air transport.

Also there are improvements in airscrews, notably in metal airscrews, which will give aeroplane and engine designers not only more durable screws, but that variable pitch for which they have asked so long.

Furthermore, two at least of the existing cross-Channel air lines are already doing so much business that they are making a profit on their running expenses, though perhaps not enough as yet to pay a dividend on the capital value of their machines and plant. And their business is steadily increasing as various business people are discovering the advantages of air transport.

For example, one firm in France making women's jumpers and other knitted goods in quantities is sending them to England by the hundredweight every week. At one shilling a pound (the rate for quantities) air transport adds less than a shilling to the cost of each jumper, and air transport means that the goods are delivered the day they are despatched, whereas if they are sent by rail they are probably hanging around for two or three weeks on the French railways, with the added chance of being stolen.

Right at the other end of the scale a big financial house is sending securities by air transport, because, apart from saving half a day between London and Paris, if the securities are lost the loss can be proved at once. If they are lost in the post in the ordinary way it takes a month or six weeks to prove loss and make financial adjustments accordingly. If they go by air, either they arrive the same day or they do not arrive at all. And so far they have all arrived.

If such facts as these could only be driven into the heads, first of all our newspaper editors, and secondly into the heads of our business men, we should soon see rapid developments in air transport and consequently in the Aircraft Industry. It is to be hoped that the audiences at the Guildhall Conference include a large proportion of such people.

Next week we shall all know the best, or the worst, about the Conference, and one proposes to deal with it in the light of that knowledge. At the same time one hopes to deal further with the needs of Civil Aviation, especially as regards the development of postal services and the proper organisation of air routes.—C. G. G.

AIR MINISTRY COMMUNIQUE No. 621.

Air Ministry Competition, 1920.

Amphibians' Awards.

The Air Ministry announced on Oct. 11th :—

The Judges Committee consider that the results achieved in the Competition for Amphibians show that a considerable advance has been attained. The conditions to be fulfilled were such as had received little attention in the past and the competing firms deserve congratulation upon the enterprise they have shown.

The Committee are of opinion that the proportion of the monetary awards laid down for this competition does not adequately represent the relative standards of merit of the first two machines, and they recommend an increase in the amount of the second prize.

The following sums have, therefore, been awarded :—

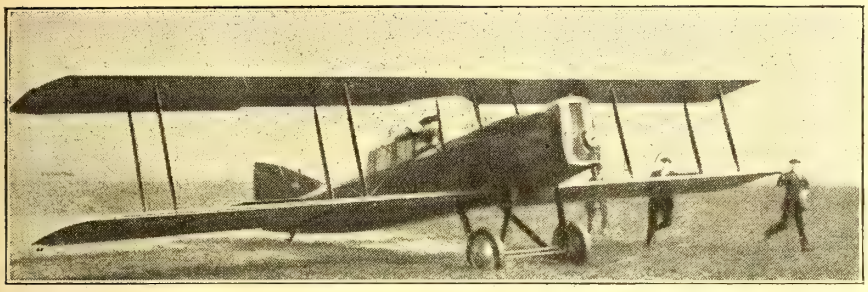
First Prize, £10,000 :—
Messrs. Vickers, Ltd.
Vickers "Viking III," fitted with 450-h.p. Napier "Lion" engine.

Second Prize, £8,000 :—
Messrs. Supermarine Aviation Works, Ltd.
Supermarine Amphibian, fitted with 350-h.p. Rolls-Royce "Eagle VIII" engine.

Third Prize. £2,000 :—
Messrs. Fairey, Ltd.
Fairey Amphibian, fitted with 450-h.p. Napier "Lion" engine.

[The only comment necessary seems to be a plain statement that one disagrees alike with the Judges' English and their judgment. The Table of Results published this week indicates that there was no such disparity of performance as to justify a drop of £6,000 between the second and third prizes.—C. G. G.]

THE PARIS TO CROYDON AND BACK RACE.



M. Bajac's S.E.A. taxying in after landing at Croydon.

It seems that the British Public is still interested in aviation, judging by the fact that a crowd of anything between 6,000 and 10,000 people gathered in and around the London Terminal Aerodrome at Croydon to see the arrival of the competing machines in the French Commercial Aeroplane Race from Paris to London and back. Almost everybody who is anybody in British aviation was present and the proceedings were thoroughly enjoyable despite the weather.

Five machines were notified as having left Paris, but of these only three—a Spad, piloted by M. Bourdon; an S.E.A., piloted by the imperturbable and skilful M. Bajac; and a Nieuport, piloted by M. Le Comte—reached Croydon. The pilots reported that there was a thick mist in France, and that conditions were slightly better on this side of the Channel. The clouds, though heavy, were at a height of well over 2,000 feet, and visibility was not by any means bad. A Farman "Goliath," which left Paris with a number of French journalists on board, put back without crossing the Channel, and another Nieuport also returned. Thus those who hoped that the Farman had emulated the Caproni which deleted twelve Italian journalists in one accident were disappointed.

In the intervals of waiting some very interesting flying was done by the Instone "Vimy," piloted alternately by Mr. Barnard and Mr. Chattaway. Major Foot, on an S.E.5a belonging to the Aircraft Disposal Company, entertained the crowd with some very fine flying before starting for Amsterdam.

The arrangements at the Croydon Aerodrome were wholly excellent. As the crowd which actually came into the aerodrome vastly exceeded expectations, the C.A.T.O., Major Greer, and his staff quickly rigged up an improvised enclosure, which held many hundreds of people in addition to those packed into the usual public pen. The arrangements for the reception of the competing machines were also made with military precision, and in every case the refilling of the petrol tanks was begun within a minute of the engine being stopped on arrival at the enclosure.

One wishes one could say as much for the organisation of the catering, but it is only fair to record that the Trust House Hotel is not normally staffed to deal with so many customers. Still, there was some excuse for the remark of one famous aircraft constructor who, after waiting for three-quarters of an hour for lunch, said, "Make them an offer for their clock, they don't really want it. What they need here is a tear-off calendar." He said that next time there was a meeting at Croydon he proposed to fit his patent amphibian undercarriage to Mr. Montague Grahame-White's yacht, as that provided the best catering ever seen at an aviation meeting.

Undoubtedly Trust Houses, Limited, will have to improve the running of that hotel at Croydon as civil aviation grows more popular. The comfortable speed at which the staff works in normal times will not suffice on days when there happens to be a special crowd, and the said staff will have to learn that on special occasions they must speed up their output.

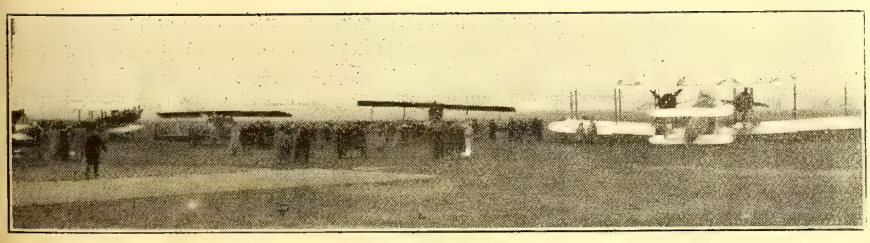
Late in the evening Major-General Sir Frederick Sykes and Brig.-General Festing arrived from Paris in one of the Air Post of Banks' Westlands, piloted by Mr. Courtney. They said that the meeting at Buc, at which they had been present during the morning, was distinctly a success, the crowd numbering some 30,000 or 40,000. They left Paris at 15.30 and arrived at Croydon at 17.45 despite the thick weather. Both expressed a high opinion of the Westland, both as regards the comfort of the machine and because, unlike some passenger machines, it is quite possible to carry on a conversation in the cabin.

The way in which the crowd gathered at Croydon and the ease with which the crowd can be handled there seems to indicate that large aviation meetings should be held there in future. It would certainly be a peculiarly suitable place for next year's R.A.F. Tournament.—C. G. G.

M. Le Comte's Nieuport being refilled before starting back for Paris.

RESULTS OF THE BUC COMMERCIAL RACES.

Pilot.	Air Line.	Machine.	Passengers.	Left Buc	Arr. Brussels.	Left Brussels.	Arr. Buc.	Flying Time.	Classed.
Le Men	Messageries	Breguet	—	10.8.50	12.17.08	12.28.22	14.31 8	4.22.18	2nd.
Deullin	Franco-Roumanie ..	S.E.A.	3	11.0 0	1.07.11	13 23.30	15 15.12	4.15.12	1st.
D'Or	Farman	"Goliath" ..	8	9.58.0	12.36.40	13.01.40	15.27.20	5.29.20	3rd.
				Left Buc	Arr. London	Left London.	Arr. Buc.		
Bourdon	Messageries Aeriennes	Spad Limousine ..	2	10,57.20	13.10	13.37	15.39.36	4 42.16	1st.
Bajac	Franco-Roumanie ..	S.E.A. Lorraine ..	3	10.48.0	13.17	14.06	16.37.35	5.49.35	2nd.
Le Comte.. ..	Transaerienne ..	Nieuport	0	10.45.45	15.29	15.48	18.30.0	—	—
Lasne	Transaerienne ..	Nieuport	—	10.36.5	Abandoned at Beauvais.			—	—
Bizot	Messageries	Spad	—	10.17.25	No Map.	Depended on following Bourdon but lost him in fog and returned to Buc.			



AT CROYDON.—Left to right, a D.H.9, M. Bourdon's Spad, M. Bajac's S.E.A., and the Instone "Vimy." The Spad arrived a few minutes before the S.E.A., and went off half an hour later. M. Bajac took a good rest and a meal, and treated everything with the utmost calm.

NAVAL AND MILITARY AERONAUTICS.

The R.A.F. Appointments and Gazettes are held over until next week.

AIR FORCE.

Airships Over London.

During the welcome home drive of H.R.H. the Prince of Wales, H.M.A. R.32 appeared over London. She came down from Howden and appeared over the West End from the south, making due north.

On Tuesday, the first day of the Air Conference, the H.M.A. R33 cruised over London for a while, having been ordered by Mr. Churchill to "mark time" over the Guildhall.

An Accident.

On Oct. 8th the steam trawler *Sea Searcher* landed three aviators at Hull. These aviators formed the crew of a Royal Air Force aeroplane which had fallen from a height of 1,000 feet into Pentland Firth on Oct. 6th. The accident occurred during a thick fog. The men declined to give particulars as to their identity until they had reported to the authorities.

The L.71.

It is understood that the Zeppelin Airship L.71, which is at present at Pulham, will shortly be commissioned for service with the Royal Air Force, and will be stationed at the Howden Airship Base.

Golf in the R.A.F.

On Sept. 28th, at Denham, the R.A.F. Team Championship was decided, Uxbridge A team of three players winning by a gross total of 509 for 36 holes. The members of the winning team were Flt.-Lieut. C. H. Hayward (plus 2), Flt.-Lieut. Clarke, and Flt.-Lieut. Macdonald. Uxbridge B was second with 548. Uxbridge A also headed the placings under handicap with a total of 503 net.

On the following day bogey competitions were held. In the morning round the first division prizes (handicap up to 10) were tied for by Flt.-Lieut. Mackay (9) and Flt.-Lieut. Wadham (5) at 1 down. In the second division Wing Cmdr. Bettington (12), 1 down, won the first prize, and Flg.Officer Siely (24), 2 down, the second. In the foursomes played in the afternoon Group Capt. Hearson (handicap 15), and Flt.-Lieut. Hayward won the first prizes, and Wing Cmdr. Bettington and Flt.-Lieut. Robertson the second.

On Sept. 30th, the individual championship of the Royal Air Force, Inland Area, over 36 holes, was won by Flt.-Lieut. C. H. Hayward, with a total of 159.

To No. 3 Squadron.

A reunion dinner of No. 3 Squadron will be held at Gatti's restaurant, behind St. Martin-in-the-Fields, on Friday, Oct. 15th. Air Commodore Brooke-Popham is taking the chair, and Air Marshal Sir Hugh Trenchard, K.C.B., has been invited. About forty ex-members of No. 3 Squadron are expected to be present.

No. 4 Squadron Dinner.

The second annual reunion dinner of No. 4 Squadron, R.A.F., will be held on Oct. 16th, at 8 p.m., at the Savoy. Air Commodore Longcroft, C.M.G., D.S.O., will preside, and Air Marshal Sir Hugh Trenchard, Bt., K.C.B., D.S.O., and Group Captain Ludlow Hewitt, C.M.G., D.S.O., have been invited as guests of the evening. Any officers of this squadron wishing to attend are requested to forward a remittance of £2 10s., to cover the cost of the dinner and wines, to Lieut.-Colonel Thomas Carthew, 2, Mitre Court Buildings, Temple, E.C.4.

73rd Wing R.A.F.

A reunion dinner for all officers who served under the Yarmouth Command will be held at Oddenino's, Regent Street, W.1, on Oct. 23rd, 1920. Will all those who have not already been communicated with, and who are desirous of attending, please communicate with either Mr. G. F. H. Bloom, 17, Welbeck Street, Mayfair, W.1, or Mr. Leonard Bridgman, c/o The Aeroplane, 175, Piccadilly, W.1?

The R.N.A.S. and R.A.F. Felixstowe Dinner.

A reunion dinner will be held in the near future in London, open to all ranks, past and present, of the Felixstowe Air Station. Will all members interested kindly communicate with the Hon. Sec., W. Kilson, 22, Manor Terrace, Felixstowe?

To N.C.O. Pilots.

It has been suggested that a reunion dinner for N.C.O. pilots and observers shall be held later in the year. Past and present N.C.Os. who would like to be present at such a union are invited to write to the Editor of The Aeroplane, who will be pleased to put them in touch with one another so that they may form a committee and elect a secretary to make necessary arrangements.

A Proposed Reunion Dinner.

It is proposed to hold a reunion dinner for "other ranks" who served in B Flight, Artillery Co-operation Squadron, R.F.C. and R.A.F., which from July, 1916, to November, 1919, was stationed at Lydd Aerodrome, Kent. Any past members who would like to attend should communicate with Mr. Leslie Smith, at 27, Knaston Road, Stoke Newington, London, N.16.

A WELCOME RETURN TO AVIATION.

Though no official notification has been issued of the fact, it is now fairly well known among those immediately concerned with commercial aeronautics that Brigadier-General F. L. Festing, C.B., C.M.G., has been appointed to an important post in the Department of Civil Aviation. The precise title of the said appointment is not announced. Whatever the position may be, it is certain that General Festing's appointment to it will not only meet with general approval, but will be highly encouraging to all who are concerned with civil aviation.

During the war General Festing was in charge of all R.F.C., and later R.A.F., personnel in France, where he won the highest regard of everyone with whom he came in contact, not only by his personal charm, but by the excellence of his selection of officers for various posts. His talent for handling men, and the fact that people will do things willingly for him which they would do most unwillingly for most other people, should be very valuable to the Department of Civil Aviation, which has necessarily a very difficult task before it in convincing the ultra-civilian element in Civil Aviation, such as the manufacturers and business men and ground personnel and so forth, that the Department really exists for the sake of helping civil aviation and not as an anti-aircraft department. One feels sure that nobody could do more to remove the latter impression and to convey the former than will General Festing.—C. G. G.

AIRCO AFFAIRS.

A meeting of the Aircraft Manufacturing Company, Ltd., was held last week, according to the *Times*, to lay before the shareholders certain plans evolved in consultation with the British, Foreign and Colonial Corporation, Ltd., which had to do with financing the firm in the past. The circular calling the meeting proposed that it should be quite private so as to ensure a free and unrestricted expression of opinion. No report of the proceedings has been issued, but one gathers from a person who was present that they were at any rate what might be described as "lively."

The directors somewhat naturally desired to know something of the standing of those shareholders who felt inclined to criticise the handling of the company's affairs, and in return one gathers that certain of the shareholders showed a desire to know something of the personal history of the chairman, with the result that there was a certain amount of argument.

According to the *Times*, "an inquiry towards the end of the meeting elicited that the occupant of that position was the vice-chairman of the Birmingham Small Arms Company, and also it was mentioned that that gentleman had become chairman of the Aircraft Manufacturing Company itself. This called forth considerable surprise, in view of the circumstances detailed at the meeting."

Further, according to the *Times*, "the Managing Director of the British, Foreign and Colonial Corporation, the issuing house of the 7 per cent. notes, made a frank statement. He said he had gone fully into the financial position, and had given many weeks' hard work in the formulation of the scheme. In addition to the £660,000 due to the bank there were, he said, further outstanding liabilities of £250,000, making a total of £910,000. He considered that the book value of the investments, work in progress and royalties represented some £2,200,000, and that these might be taken now at perhaps about half that amount. He deprecated a forced liquidation, and told the meeting that he himself was largely interested in the company, and was anxious that the scheme proposed should receive full consideration."

It was finally suggested that a scheme to improve the financial position of the company should be printed and circulated, and it seems likely that this suggestion will be approved by the directors.

THE SOPWITH COMPANY.

At a meeting of creditors of the Sopwith Aviation and Engineering Co., Ltd., it was pointed out that the company was formed in 1913 with a nominal capital of £26,000. Up to a year ago the company did so well that reserves of £900,000 were accumulated. An approximate statement has been prepared which shows assets to a value of £862,630 and liabilities at £583,510. It seems likely that a large amount of the latter, which is at the moment E.P.D., may be recovered.

STUDY THE FIGURES

The Figures for the Amphibian Tests are published This Week.

Compare the Figures of the Four Year Old FAIREY Float Seaplane with those of her New Flying-Boat Competitors.

The Fairey Amphibian was designed in 1916 as an ordinary Seaplane, was known officially as the N.10, and was the first of the Fairey "Series III."

She was delivered to the R.N.A.S. in April, 1917.
She was on Service till after the Armistice.
She was bought back in May, 1919, as a "Disposal" Machine.
She was used to carry newspapers from Blackfriars to Thanet.
She was used for Experimental Work during the Summer of 1919.
She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact under her own power.
She was used with experimental Amphibian Undercarriages during the early part of 1920.
She did Ferry Work between Southampton and Sheerness.
She has survived Nine Different Engines.

In all this work no Single Component Part has been replaced except the Undercarriage. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted.

The Wings have only been re-covered once, the Tail-Unit still has the original fabric.

The Cock-Pit has been altered to carry one, two, and three people.

DESPITE ALL THIS

Her Performance Equals that of the Best Modern Flying-Boats.

THE LATEST TYPE FAIREY SEA-PLANES and AMPHIBIANS,

Being all Sold to the Government, could not be entered for the Martlesham Tests.

The Fairey Aviation Co., Ltd.,

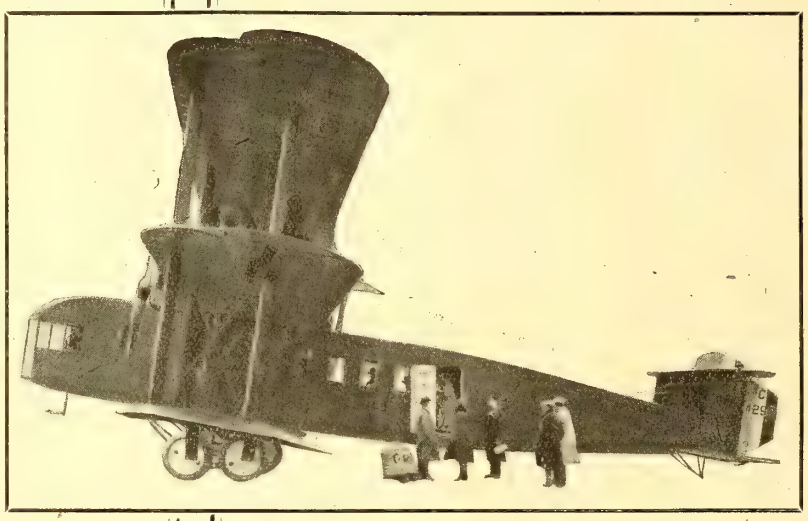
Head Office - - HAYES, MIDDLESEX.

London Office - - EMPIRE HOUSE, 175, PICCADILLY, W.1.
Works: HAYES, MIDDLESEX, & HAMBLE, near SOUTHAMPTON.

Telephones—19 Hayes, Middlesex.
394 Regent.

Telegrams—"Airily, Hayes, Middlesex."
Code—A.B.C. 5th Edition.

The "Bristol" Aeroplanes



RELIABILITY in aerial transport work can be ensured by the use of the "Bristol" Pullman Triplane.

"Without detracting from the fine performances put up by the two-engined buses," writes the aeronautical correspondent of "The Pioneer," "I must say that a company wishing to run a transcontinental mail and passenger service ought to get the best results in speed and reliability by using 'Bristol' Pullmans."

Detailed and illustrated particulars of this type may be had upon application.

The BRISTOL AEROPLANE COMPANY, Ltd.

FILTON — BRISTOL.

Telegrams—"Aviation Bristol." Telephone—3906 Bristol.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

An article by Capt. Sayers discusses the visible prospects of improving aeroplane performance by refinements of design devoted to the reduction of parasitic resistance. This shows that there are distinct possibilities of marked improvement quite apart from any improvements of wing qualities.

The official results of the tests on amphibian machines in the Air Ministry Competition at Martlesham are published on page 644.

An account of the proceedings at Martlesham on the evening of Sept. 28th, when the competitors at that competition entertained the Judges and their assistants testifies to the highly cordial spirit in which the competition itself was conducted. [Or to the efficacy of the spirit in the cordials absorbed.—C. G. G.]

POSSIBLE ADVANCES IN AEROPLANE EFFICIENCY.

By Capt. W. H. Sayers.

In the present state of society all industrial and commercial enterprises are inevitably subject to periods of irregularly alternating prosperity and depression. The really far-sighted business man uses periods of relative slackness in business to review his existing methods of carrying on trade, to repair deficiencies in his works or plant, and generally to look for and to remove such contributory causes for that depression as are within his own direct control.

At the present moment the Aircraft Industry throughout the world is in a state of very acute depression, and although it may very fairly be contended that to some considerable extent this depression is due to the failure of the public at large to realise the value of the services which aircraft can even now render, it would be idle to pretend that it is solely due to causes outside the control of the Industry directly concerned.

In the first place the business of propagating a reasonably accurate knowledge of the capacity of existing aircraft is definitely one which falls within the province of that Industry, and it may well be questioned whether this problem has been given any very intelligent consideration.

But entirely apart from that fact no one will attempt to maintain that the types of aircraft now in existence can be regarded as having reached such a stage of development that there remains but little room for technical development tending to increase the economy and the reliability of aerial transport.

This being the case, the present seems an appropriate time for a consideration of some of the possibilities of improvement in the design of aircraft.

Some Already Discussed Prospects.

These possibilities extend in many directions, and some of these directions have already been the subject of speculative exploration. On the pressing subject of increased reliability and safety, a very considerable amount of discussion bearing upon the design and installation of engines of various types and arrangement has occurred, and in this direction there is undoubtedly room for a very large degree of improvement.

In regard to the improvement of the aeroplane itself, there has been less speculative activity, and such discussion as has occurred has been mainly confined to questions as to the structural modifications in war-time types called for by commercial purposes, both from the point of view of providing a more useful type of accommodation and for the securing of a higher structural efficiency, together with a certain amount of disputation as to the relative value and cost of maintaining such speeds as were developed in war aircraft upon commercial services.

These are all of them important questions, of immediate import, but their solution for any particular case or type of aerial service is necessarily a solution limited by the existing state of practical aeroplane design, and discussion is practically invariably confined to the effects of minor variations from conventional types of construction.

The present moment seems a very opportune occasion for a consideration of extreme variations from existing types with a view to getting a rough idea of what can be done in the light of existing knowledge toward improving the aeroplane of to-day.

For the moment considerations of possible improvement in the aerodynamic qualities of the aeroplane itself will alone be considered.

For this purpose it will be well to take a representative machine of present-day type and attempt to make an analysis of the way in which the output of the engine is dissipated in flight.

A Power Balance Sheet.

In the absence of exact determinations of the resistances of the component parts of an actual full scale aeroplane in flight it is only possible to make a very approximate analysis, but for the present purpose this should suffice.

Consider the case of a normal tractor type biplane, of 400 sq. ft. surface, weighing 3,000 lb. fully loaded, and fitted with an engine of 300 b.h.p. Such a machine will have a sea level top speed of approximately 120 m.p.h.

At that speed the 300 b.h.p. of the engine will be expended in some such manner as is indicated in the following table :—

Airscrew losses	22 p.c	66 h.p.
Wing drag	33 p.c.	100 h.p.
Wing strut and wiring resistance	10 p.c.	30 h.p.
Tail surfaces resistance	5 p.c.	15 h.p.
Fuselage and radiator resistance	22 p.c.	66 h.p.
Undercarriage resistance	8 p.c.	23 h.p.
Total	100 p.c	300 h.p.

Taking the items of this energy account in order, the airscrew losses offer no prospect of any great reduction by any visible method, and for the moment it may be assumed that something like 80 per cent. airscrew efficiency cannot be greatly improved upon.

The Wings.

The item of 33 per cent. of engine power used in overcoming the wing resistance is probably as low as it will be possible to attain at such a speed as 120 m.p.h., given that a landing speed not greatly in excess of 45 to 50 m.p.h. is necessary. It is, in theory, susceptible of improvement if monoplane wings are used instead of biplane, but in practice this will involve a greater span and structure weight, and no actual reduction in the power expended for a given useful load carried, though the power may be reduced relatively to the total weight of the whole machine.

If, however, this item of wing drag is taken conjointly with the next item of wing strut and wiring resistance, there may be possibilities of a net saving.

It is probable that a high lift cantilever monoplane construction could be arranged to give equal landing speed, and equal structural weight and a saving on total wing structure resistance at this speed. Taking both bracing and wing resistance into account the equivalent lift/drag ratio for the biplane at 120 m.p.h. is equal to about 7.4, at a value of lift coefficient Kl of 0.11.

A monoplane of equal span and half the area would require a maximum lift coefficient of about 1.2 to give a landing speed equal to that of the original, and an L/D of 7.4 at Kl = 0.22 to give the same resistance at 120 m.p.h. These figures will almost certainly be reached in the near future. Purely as wing figures they are perfectly possible, but at the moment no very certain data as to suitable wings capable of being used in a cantilever construction is available.

But the whole question of possible improvement in aerofoil efficiency is one of great complexity and requires a separate consideration. For the present it will be assumed that the combined wing and wing-bracing resistance cannot be appreciably reduced.

The tail-plane, rudder and fin resistances account for only 5 per cent. of the total power expenditure, and no very great room for improvement is here available.

The fuselage item, 22 per cent., is, after the wings the largest single item in the account. This figure corresponds to that of a reasonably well shaped fuselage with two open cockpits. Abolition of the cockpits would reduce this figure appreciably, but obviously pilot and crew must be placed somewhere, and the cockpits can only be done away with by totally enclosing the crew. This will involve an increase in the cross section of the body.

But the resistance coefficient of a reasonably good streamline shape can be made to be about one third of that of a normal fuselage, and thus a totally enclosed fuselage free from openings and projections, of 50 per cent. greater cross section than the open type will have only one half of the resistance thereof. This result cannot be obtained in a body with a nose radiator, and in return for the reduction of body resistance an addition must be made for radiators or equivalent cooling resistances removed from the body. On the whole it will be well on the safe side to assume that the body resistance is capable of a reduction to $\frac{5}{8}$ of its present value by careful shaping and the removal of all projections or orifices, and the placing of radiators in free air.

RETRACTABLE UNDERCARRIAGES.

The last item of the list is that of undercarriage. Now it is perfectly possible to withdraw the undercarriage entirely within the body, and so abolish this resistance entirely. The cost thereof is added weight. But for the moment this will be neglected.

Summing up and neglecting the possibilities of improving the efficiency of the wing structure the power account for a machine which is aerodynamically possible to-day, of the same total weight and landing speed as the original will, at 120 m.p.h., be somewhat as follows :—

Wing drag, including struts and wires	130 h.p.
Tail resistance	15 h.p.
Fuselage resistance, including radiators	40 h.p.
Undercarriage resistance	—
Total resistance h.p.	185 h.p.

B.H.P. needed at 78 p.c. airscrew efficiency $= \frac{185}{0.78} = 233$ h.p.

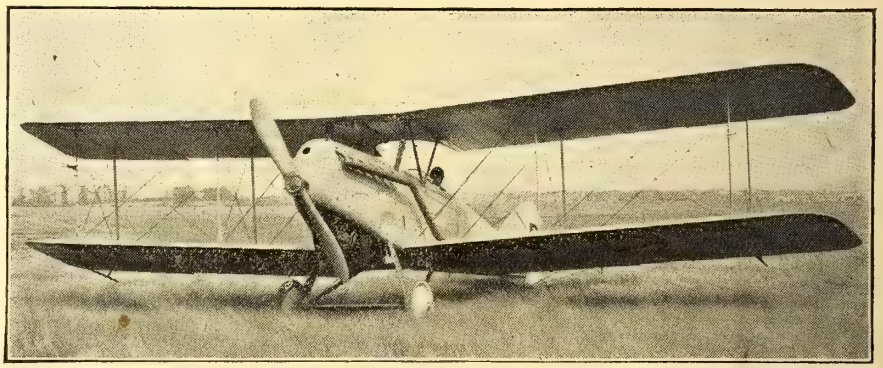
A gross saving of 67 h.p.—22 per cent. of the original h.p.—is therefore possible, and this saving involves a considerable reduction in the weight of power plant. Taking the installation as a whole, including all bearers, tanks, radiators, water, etc., but not fuel and oil, this will, in any case, amount to not less than 3 lb per h.p., or, say, 200 lb.—an allowance ample to offset the weight of the undercarriage retracting gear, and allowing for an addition to the useful load capacity of the machine of 22 per cent. of the weight of fuel needed by the original for any given journey.

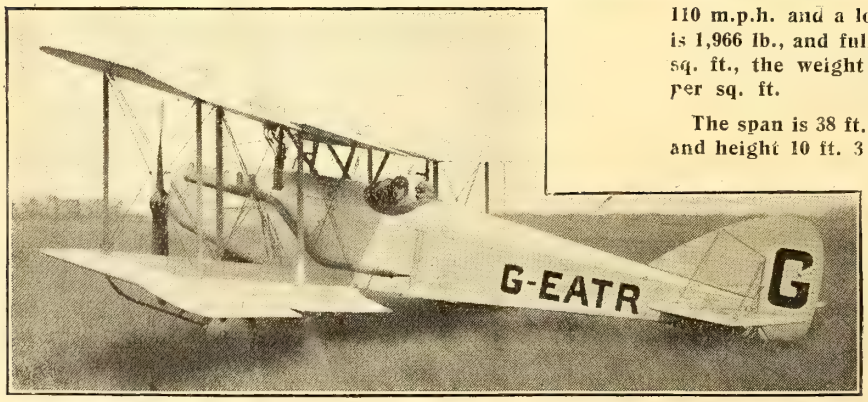
There are obvious difficulties of construction to be overcome—particularly in the direction of arranging for an adequate view by the pilot in a totally enclosed fuselage of really good streamline form. These would seem to be insuperable in the case of the ordinary single-engined tractor-type machine, and this fact may be found eventually to justify the abandonment of some of the advantages of this type for the sake of a more efficient form of body.

But although this rough analysis does indicate that there is room for a substantial improvement in the design of aeroplanes by a process of cutting down what is usually known as parasitic resistances, it also shows very clearly the immense importance of continued research on wing sections and wing structures if any very great reduction is to be made in the power necessary to propel aircraft at the speeds now common.

In the analysis, now carried out, the condition of top speed for the particular machine in question has alone been considered. The relative importance of the wing resistance as compared to the parasitic resistances will become less at lower speeds, thus leading to the apparently paradoxical conclusion that there are greater advantages to be secured at low speeds by a careful attention to the reduction of head resistance than at high. If, however, it is remembered that it is only the relative importance of such resistance as compared to that of the wings, and not its absolute value which varies, the paradox disappears.

THE AUSTIN KESTREL.—Two views of the very neat two-seater which secured the third prize in the small class of the Air Ministry competition for small aeroplanes. Structurally, steel is largely used in the construction, the fuselage being entirely of this material, and steel tubes are used for the whole of the undercarriage, the interplane struts, and the wing drag struts. As is obvious from the lower view, the crew of two sit side by side, the passenger's seat being very slightly behind that of the pilot. Fitted with the 160-h.p. Beardmore engine and carrying the full trials load, the machine has a top speed of 110 m.p.h. and a low speed of 45 m.p.h. The weight empty is 1,966 lb., and fully loaded 2,740 lb.; the total surface is 416 sq. ft., the weight per h.p. 15.7 lb., and the loading 6.6 lb. per sq. ft.





The span is 38 ft. 6 in. chord 6 ft., length overall 25 ft. 6 in., and height 10 ft. 3 in. A petrol capacity of 46½ gallons, sufficient for four hours' flying, is provided.

All modern precautions against petrol fires are installed and a fireproof bulkhead separates the engine from the fuel tanks. In later editions of the machine it is understood that rigid tube bracings will replace the usual type of streamline wires in the wing structure.

First Again

TWO 450 H.P.

NAPIER

engined aeroplanes competed in the Government trials at Martlesham. The Westland in the small class, the Handley Page in the large class.

Each secured the **HIGHEST PRIZE** awarded for its class.

"It will be observed that both machines have Napier engines. Both scored heavily in the economy test, one of the factors undoubtedly being the lightness of that engine in relation to its power."

Daily Telegraph, 30/8/20.

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THE AIR MINISTRY COMPETITIONS, 1920.

TABLE OF DATA REGARDING AMPHIBIANS—ARRANGED ALPHABETICALLY. AIR MINISTRY COMMUNIQUE, NO. 618.

The Air Ministry announces:—The following table gives the data obtained regarding the Amphibian machines which took part in the Air Ministry Competitions at Martlesham Heath, and Felixstowe. Notes are appended for explanatory purposes.

Name.	Horse Power.		Area sq. ft.	Weight in lbs.							Fuel used in 3½ hours cruising.	W./G.	Speed.				"Get off" feet above zero.	Landing, yards from mark.	Lb. per h.p.				Lbs. per sq. ft.	
				Total.					Useful load.				Cruising.						Total.		Useful load.			
	Nominal H.P. and type of engine.	Actual. (a)		Empty (including water and mooring gear.	With fuel for 350 sea miles at cruising speed.	Performance tests.	Reliability test.	Certificate of Air-worthiness.	Performance test.	Reliability test.	Petrol and Oil. Total.	(b)	Indicated.	Actual.	High.	Low.	(c)		Performance tests.	Reliability test.	Performance tests.	Reliability test.	Performance tests.	Reliability test.
Fairey	450 h.p. Napier "Lion"	504 at 2200 r.p.m. (On high speed test r.p.m. were 2200)	544.2	3771	4507	5207	5250	5250	500	(d) 543	62.-2. 64	8.5	80. m	81.8 m 71. k	(e) 118.5 m 103. k	54.4 m 47.25 k	Land. 47 89 Sea. 104	337	10.33	10.42	.99	1.08	9.57	9.65
										538	60.7 - 1.5 62.2	8.65	78.5 m	79.5 m 69. k	108.5 m 94.5 k									
Supermarine	350 h.p. Rolls Royce "Eagle 8"	352 at 1800 r.p.m (On high speed test r.p.m. were 1900)	600	3996	4720	5420	5700	5700	500	(f) 780	58.75 - 6.6 65.4	11.88	77. m	77.35 m 67.25 k	94. m 82. k	55. m 48. k	Land 60 Sea 102	321	15.4	16.19	1.42	2.22	9.03	9.5
										674	75. - 1.75 76.75	8.8	80. m	80. m 69.6 k										
Vickers "Viking III"	450 h.p. Napier "Lion"	504 at 2200 r.p m. (On high speed test r.p.m. were 2190)	520	3622	4200	490	4900	4900	500	500	49.75 - 1.5 51.25	9.75	80.25 m	82. m 71. k	121. m 105. k	52. m 45.25 k	Land. 94 177 Sea. 341	382	9.72	9.72	.99	.99	9.42	9.42

Explanatory Notes.

(a) Figures for horse-power were taken from the logbooks of the engines concerned. The r.p.m. attained on the high-speed tests are given for comparison.

(b) The figures for W/G should be halved for comparison with the similar figures for aeroplanes published in A.M. Communiqué No. 607.

(c) In order to facilitate the photographic measurement of these heights the tests of the Fairey and the Vickers machines were carried out with a 275-yards' run in lieu of the 400 yards distance laid down in the rules. The first figure under the sub-heading "Land" gives the actual height attained in 275 yards; the second figure is the corrected height for the 400 yards distance.

(d) The Fairey was permitted to undergo a second economy test owing to bad weather conditions on the first test. The figures for both tests are given in the order in which they took place.

(e) The higher figures were obtained with the undercarriage raised, the lower with the undercarriage down. Similar alternative tests with the Vickers showed no difference in speed.

(f) The first economy and the reliability test of the Supermarine were ended after 3 hr. 10 min. owing to the fracture of an oil-pipe on the engine. The first figures given are those based on this flight; the second are those based on a further 3½-hours' flight at a low altitude in bad weather on the last day of the Competition.

(m) Miles per hour.

(k) Knots.

Notes on the Amphibian Tests.

The results attained by the amphibian machines as shown in the above table are of very considerable interest, particularly considering the novelty of the types in question. It may be noted particularly that every machine tested exceeded the specified top speed of 80 knots by a comfortable margin, and that all of them failed, as in the case of the land machines, to reach the specified low speed of 45 knots.

In regard to the getting-off tests, all three amphibians were comfortably over the 25-ft. obstacle, not merely in the 400 yards specified, but even in the 275 yards on the land, as well as satisfying the sea get-off and the landing over the obstacle tests. It must not be forgotten that the tests for the amphibians were less stringent than those for the land machines; nevertheless, the fact that these machines all fulfilled the requirements of these tests reflects considerable credit on their designers.

The relatively low value of the W/G figures when reduced to be comparable to those of the land machines is but natural under the circumstances, but it may be taken that the unreduced figures—which are higher for the amphibians generally than for the aeroplanes—indicates that they have succeeded more nearly in fulfilling the demands of those responsible for the rules.

There should be no question in this case of withholding the full first prize, as the amphibians distinctly represent a step forward in aircraft design.—Ed.

The Aeroplane Competitions.

It is of interest to know the collaborators who helped the winning machines to establish their positions. The Westland which won the prize for the small class was doped with Cellon. As everyone knows, its power plant was a 450-h.p. Napier, and K.L.G. (F.15) plugs were used, which gave every satisfaction. The Claudel-Hobson type carburetter built by Napier's increased the already very high reputation which it has justly earned. The Magneto was a B.T.H.

The Handley Page W.8 which won the competition for big machines was doped with Emaillite. Owing to its artistic colour scheme a bystander thought that it had been doped by Augustus John. Here again Napier engines with K.L.G. plugs were used. The Claudel-Hobson carburetters were found to be entirely satisfactory. In this case the magnetos were again British Thomson-Houston. Owing to one's personal experience of this magneto one is not surprised at their success. Palmer tyres were, of course, used by all competitors. The airscrews for both machines were built by W. A. Oddy and Co.—G. D.

BEARDMORE

AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

THE MARTLESHAM REVELS.

[NOTE.—Owing to the importance attached to the much less exciting picnic which occurred at Etampes at about the same time, the account of this affair was forcibly held over from its place amongst last week's news.—W. H. S.]

On the evening of Monday, Sept 28th, the Martlesham Hostel was the scene of one of those outbreaks of high spirits, now, alas! uncommon, but which were, in days of yore, frequent wherever two or three aviators were gathered together.

The occasion was that of a dinner given by the competitors in the Air Ministry Competition for Amphibians to the judges and to the officers of the Martlesham Air Station. In the promotion of this festivity the most active part was taken by the crew of the Supermarine, headed by Mr. Scott Paine, and Commander Bird, who were ably aided and abetted by the Pilots Union (Messrs. Broome, Cockerell, Hoare, and Nicholl).

Naturally enough, a thoroughly nautical atmosphere pervaded the evening.

On arrival at the entrance to the hotel guests were confronted by a legend, chalked on the threshold, "Martlesham Pier, toll 1d.," and by certain of their hosts, clad in garments redolent of the sea and Castrol combined, were decorated with a pier ticket and instructed to embark—in the captain's gig—upon *"R.M.S. Immoral Castle."*

The captain's gig, upon inspection, proved to be a novel type of amphibian possessing many curious features. Unlike the majority of such craft, the flotation gear was apparently retractable—it was at least not visibly present—while the landing wheels were, as far as could be discovered, the only permanently fixed portion of the whole.

Structurally the design was of an extraordinary robustness, but aerodynamically the machine possessed grave faults. Its stability directionally was negligible, and its behaviour longitudinally would have intensely interested Mr. Lanchester as a very perfect case of what he has so aptly christened "catastrophic instability." Even those two eminently capable pilots, Messrs. Broome and Cockerell, failed to make one reasonably smooth landing with this machine during the evening, as it insistently inverted on switching off at the end of each flight.

Fortunately for the passengers, ample restoratives were available once aboard the ship.

On the arrival of the judges they were at once weighed in, the intention being that at a later stage they be weighed out to determine their soakage during the evening. Unfortunately the weighing apparatus was not altogether satisfactory, and the results actually obtained were so largely affected by instrumental and observational errors that it has been decided that they shall not be published.

A further ceremony, wherein the ship's barber had been scheduled for a leading part, was necessarily abandoned on account of the unavoidable absence of his victim—detained on less amusing business elsewhere.

Dinner thereon ensued. This in itself was excellent, though if one may offer a suggestion to the *maître d'hotel* it would have been improved had rolls been substituted for the ordinary household bread provided. The penetration of the roll is little greater, but it has manifold advantages in steadiness of flight and regularity of trajectory. Despite this minor defect of equipment much excellent shooting was made during the course of the meal. The closing stages of the engagement were marked by a display of markmanship of a very high order by one of the guests, who scored a long series of consecutive bulls with walnuts.

Dinner was followed by speeches wherein, after the customary toast of the King, the competitors expressed their high appreciation of the work of the judges and of the staff at Martlesham. The response on the part of the officials led to reopening of the ancient controversy as to which of two of them was the most unfluent of speech, and the problem was undoubtedly in part solved.

He of them who hesitates most after dinner successfully evaded the making of a speech, substituting therefor three stories. Apropos the Vickers entry a curious visitor inquired what it was called, and was told "The Viking." 'Oh," he replied, "I suppose it's Pegasus." "Pegasus? Why?" "Well, I thought a Viking was a (N)orse!" Noting the cowling on the fore cockpit of the Supermarine he asked its reason and was told it was to protect the passengers. "Oh, I see—if the pilot has cold feet that keeps the Hoare frost from them." Having been taken for a joy flip on the Fairey he announced that she was very nice, but that there was a curious smell about her. "O, well," was the reply, "that's natural. A nickel is always good for five cents."

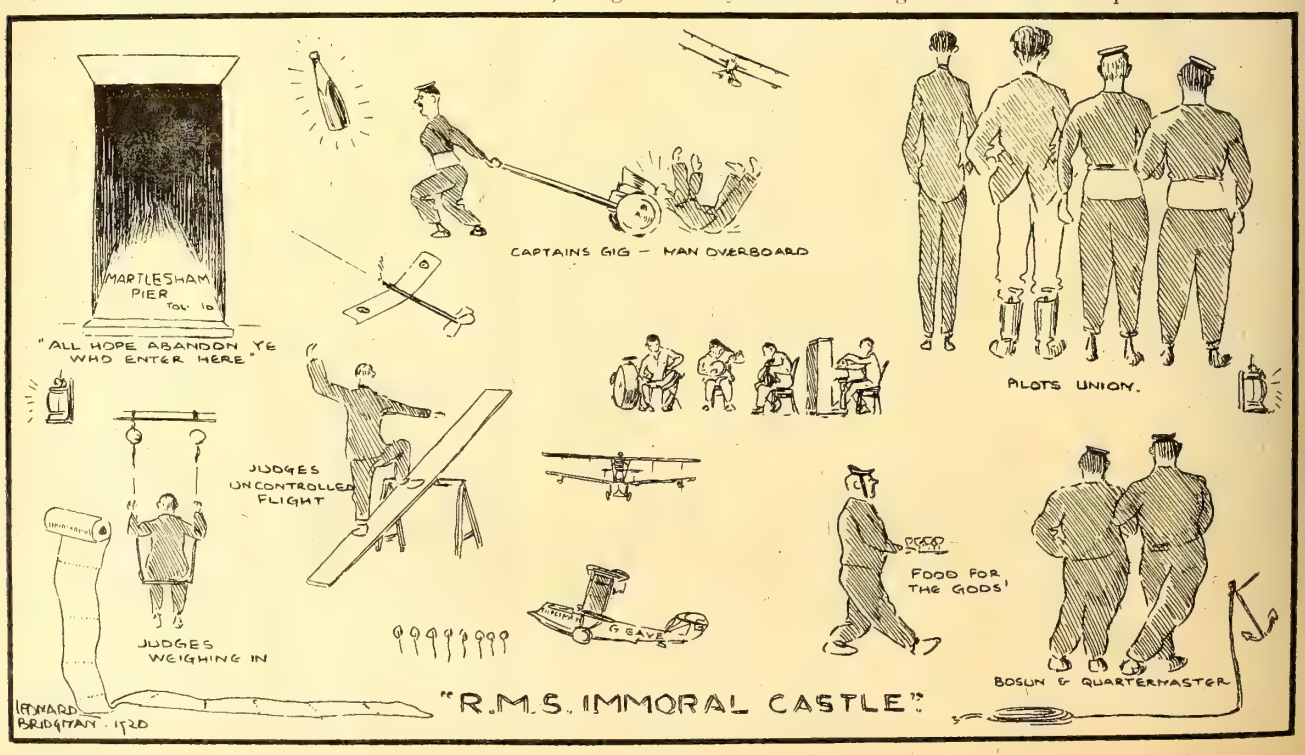
Immediately after dinner the judges' self-controlled flight test was made. The nature thereof is adequately shown in one of the annexed set of diagrams, and it is a high tribute to the stability and manœuvrability of these gentlemen to be able to record that none of them crashed, and only one made a slightly bumpy landing. Even this may safely be put down to the abnormal roughness of the sea at the moment.

Thereafter the Martlesham Jazz Band—which throughout provided music appropriate to the proceedings—settled down to real work, and, at imminent danger to string and wind, set the time for a display of terpsichorean activity of a high order. Most of the assembly tripped, some of the toes were far from light (one the writer can feel to this day), but they were all of them fantastic.

During this period certain very curious phenomena were observed—in particular a violent tendency to levitation on the part of a number of cushions and even of wicker chairs, which terminated in a fairly complete dissolution of these articles. Unfortunately, no member of the Psychical Research Society was present, and an adequate explanation of their dematerialisation has not yet been offered.

Proceedings were eventually terminated in the small hours by failure of both electric light and of liquid fuel.

Only material damage has so far been reported.



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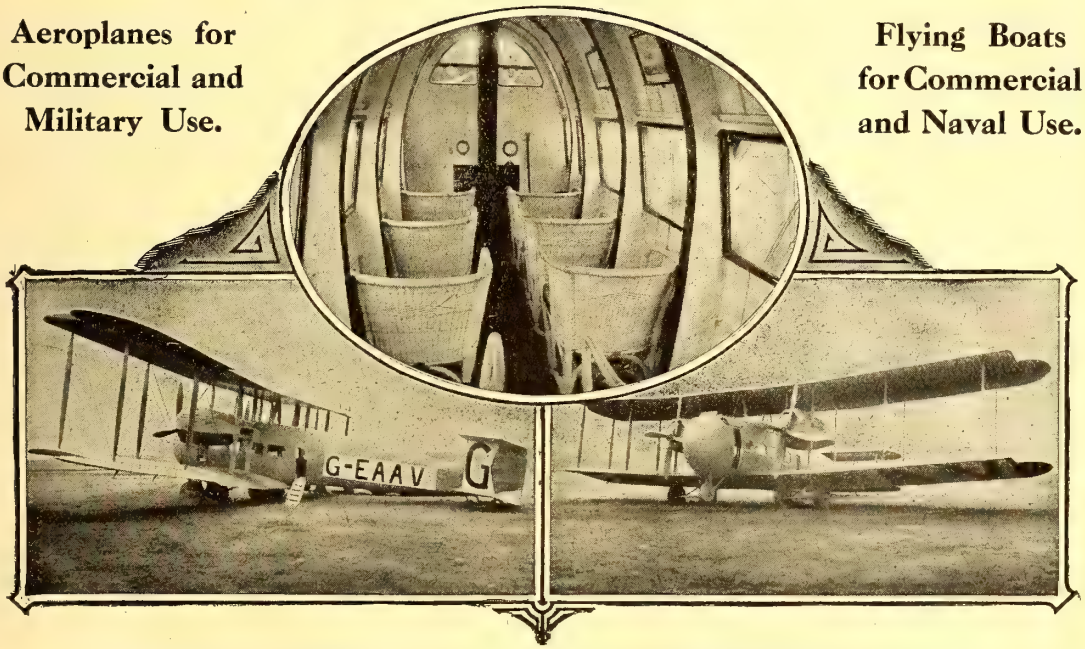

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THE PARACHUTE PROBLEM.

The following interesting letter has been received from Herr Max Unz, late of Frankfurt-on-Main, and now of Smyrna :—

Sir,—In the American review of "Science and Invention" in *The Literary Digest* for Aug. 2nd, 1919, which I received by chance, Lieut.-Col. H. S. Holt, who writes in the Aeronautical Engineering Supplement to THE AEROPLANE (London), states that he has devised a system of parachute which he calls an "Autochute."

He describes the new idea of the "Autochute" as follows : "and he has devised what he calls an 'Autochute,' or compound parachute system, in which the release of the main parachute is effected by a smaller or 'pilot parachute,' which is released before the man jumps and relieves the strain on the large parachute at the moment of opening. . . ."

I have the honour to give you the following communications, and to ask you to publish them :—

I myself have constructed and practically experienced more than two years ago a system of parachute similar to the one described by Col. H. S. Holt.

On Oct. 30th, 1918, I gave notice of a patent to the following patent offices :—

1. To the Austrian Patent Office in Vienna, under No. 38840/18.
2. To the Hungarian Patent Office in Budapest, under No. 13526.
3. To the Czecho-Slovakian Patent Office in Prague, under No. 17295/3857.
4. To the German Patent Office in Berlin, under No. 26575.XI.77H8a.

These notices have been published and explained by the mentioned patent offices, and the publication of the German Patent Office is imminent.

My invention has been explained and published by the three patent offices, with the following main titles :—

1. Aus Haupt- und Hilfsfallschirm bestehende Fallschirmkonstruktion, dadurch gekennzeichnet, dass die Oeffnung des Fallschirmes unanhängig vom Flugzeug, ohne irgendein Verbindungsmittel mit demselben und ohne irgendwelche mechen. Oeffnungseinrichtungen, also nur unter dem Einfluss des Luftwiderstandes erfolgt, um die Sicherheit des Funktionierens zu erhöhen.
2. Fallschirmkonstruktion nach Anspruch 1, dadurch gekennzeichnet, dass der Hilfsfallschirm (Pilot) am Körper des Abspringenden in Griffnähe angebracht ist, um durch den Abspringenden selbst, ohne Benützung irgendwelcher Zwischenmittel betätigt werden zu können.
3. Fallschirmanordnung, dadurch gekennzeichnet, dass die Packhülle des Fallschirmes durch einen infolge des Luftdruckes sich entfaltenden Hilfsfallschirm geöffnet wird, wodurch der eigentliche Fallschim zur Entfaltung frailiegt.

The German Patent Office in Berlin has accepted the following main title :—

1. In einem auf dem Rücken des Fliegers zu befestigenden Behälter untergebrachter Fallschirm, dadurch gekennzeichnet, dass der Behälter aus einer durch ein Gurtszstem unverrückbar am Körper gehaltenen zusammenlegbaren Packhülle besteht, deren Verschlussvorrichtung durch einen am Körper des Fliegers in Griffnähe angebrachten Hilfsfallschirm geöffnet wird, sobald letzterer von dem Abstürzenden freigegeben wird und sich infolge des Luftdruckes entfaltet.

From these official definitions of the patent offices results that the system of a compound parachute or a main parachute with pilot parachute, whose function is to release the knapsack (fixed on the back of the flier) and to draw out the main parachute, has been published much earlier by myself.

Also the other characteristics of the construction mentioned in the publication of Lieut.-Col. H. S. Holt, I published in the patent office long before Col. Holt did so.

I give you below the particulars :—

The writer in practice attaches the pilot to the circumference of the hole in the main. Correctly speaking, the pilot cable should be attached directly to the cable of the main at the point where the lines meet. In this way the load on the pilot parachute would be transmitted direct to the cable of the main, instead of through the fabric of the main.

[Der Hilfsfallschirm dient dazu, den Verschlussdraht herauszuziehen und die Oeffnung der Packhülle und Entfaltung des Hauptfallschirmes zu bewirken. Der Verschlussdraht besitzt in der Hälfte seiner Länge eine Schlinge. An dieser Schlinge ist mittels seiner Tragschnüre der Hilfsfallschirm befestigt. Ferner ist der Hilfsfallschirm mittels einer Schnur an dem oberen Ende der vereinigten Tragschnüre, welche die Ausströmöffnung zusammenhalten, befestigt.]

In the type of "Autochute" shown in the illustrations the main parachute is carried on the aviator's back in a sort of knapsack with a spring lid.

[Der verpackte Fallschirm ist mittels der Schultergurten wie ein Rucksack auf Rücken zu nehmen und mittels der Brustgurte festzuschnallen.]

The method of operation is as follows, as described by Col. Holt : "The pilot parachute is withdrawn and held in the hand, and the man gets in a position to jump overboard. The instant before jumping he releases the parachute, which opens as soon as he begins to fall, and draws out the main parachute."

[Soll der Fallschirm zur Anwendung gelangen, so hat sich der betr. Flieger zunächst von dem ihn am Sitz zurückaltenden Anschnallgürteln freizumachen, und nimmt eine Stellung zum Abspringen ein. Dann löst er den zwischen Körper und Brustgürtel eingesteckten Hilfsfallschirm durch Herausziehen und wirft ihn über sich. In diesem Augenblick öffnet der durch den Luftdruck in die Höhe gepresste Hilfsfallschirm die Packhülle durch Herausziehen des Verschlussdrahtes und entfaltet den Hauptfallschirm innerhalb sehr kurzer Zeit (versuchsgemäs unter 2 Sekunden). Bis zu diesem Moment ist das Flugzeug genügend weit entfernt, sodass das Herabschweben ohne Gefahr erfolgen kann.]

Besides this official patent notice of Oct. 30th, 1918, there exist a number of private publications which I made before the official patent notice. There also exist a number of reports which I made to military offices, and a report, dated Sept., 1918, to the Ministry of War in Vienna, Aeronautical Section, in which I notified the mentioned patent office and by which I asked to be allowed to publish the patent notice.

During 1917 and 1918 I made many experiments from aeroplanes on various places. Also after the war I made public experiments with the parachutes in Johannisthal (Berlin, June, 1919).

I beg you to kindly take note of this communication and to publish it, in order to avoid any misunderstanding which may arise from the publication of Lt.-Col. H. S. Holt.

(gz.) MAX UNZ.

"THE AERONAUTICAL JOURNAL."

The October issue of the *Aeronautical Journal*, the official organ of the Royal Aeronautical Society, 7, Albemarle Street, W.1, contains an important paper on Wire Ropes by Mr. Walter Scoble, which is of great interest to the engineering profession generally. During the war Mr. Scoble was engaged at the East London College upon work for the Admiralty in connection with the anchoring cables of kite balloons, and it is the result of these researches which is now published. The scope of the paper is of such a wide and general nature that it is of interest to all engineers who use cables for winding and driving work.

The same number of the journal also contains an important paper by Mr. Harris Booth on "The Design of Spars with Off-set Pin Joints."

It should also be pointed out to all readers of THE AEROPLANE that in the *Aeronautical Journal* there are regularly published in full the papers which are read and the discussions which occur at all the meetings of the Royal Aeronautical Society.

In a paper subject to such limitations as to space as those prevailing in the case of THE AEROPLANE it is only possible to report in a very brief abstract the more important of these papers, and it is therefore incumbent upon all who wish to be properly informed upon matters aeronautical to purchase the *Aeronautical Journal*.

A USEFUL ALLIANCE.

Barimar, Ltd., who are so well known as manipulators of acetylene and other forms of welding, announce that Mr. W. Ewen has been appointed deputy manager.

The firm's business, big as it was during the war, is still increasing, and consequently the energetic managing director, Mr. C. W. Brett, has found that the amount of work necessary is past the scope of even his abounding energy. Hence the appointment of a deputy. Mr. W. Ewen, who is a near relative to Mr. W. H. Ewen, the well-known Scottish aviator (late Major R.A.F.), has recently left the Avro Co. His knowledge of and interest in things aeronautical will therefore enable him to give particular attention to any work sent to his firm by firms in the Aircraft Industry.

Both Barimar, Ltd., and Mr. Ewen are to be congratulated on this appointment.

"THE TAG END."

Under the above name, Accles and Pollock, Ltd., of Oldbury, Birmingham, the well-known makers and manipulators of steel tubes, etc., are issuing a House Journal, the first number of Volume I appearing for the month of October. The advantages of a house journal to any large manufacturing concern are twofold. It is an opening for people with ideas, suggestions, and opinions to bring these ideas, etc., before all, and it also establishes a sort of liaison between all members of the firm, from the highest to the lowest.

The publication is certainly produced well and contains much that is of interest to the firm's employees and others, so that the success of the venture should be assured.

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TRADE NOTES.

Wave-Power Transmission.

Very many of the readers of THE AEROPLANE must be thoroughly well acquainted with the "Constantinesco" or "C.C." gun synchronising gear which was so extensively used during the war on British and Allied fighting machines.

Numerous types of synchronising gear were fitted to various types of machine-guns, with more or less success, in an endeavour to allow of firing through the airscrew without hitting that vital organ. All of them, including the C.C. gear, consisted essentially of cams, equal in number to the blades of the airscrew, rotating with the airscrew and controlling the movement of the firing-pin of the gun in such a manner that firing did not occur when an airscrew blade was in the line of fire.

But whereas in the majority of such gears the movement initiated by the cam was transmitted to the firing mechanism by means of levers, push or pull rods, and the like, in the C.C. system the cam gave motion to a piston and the impulses were transmitted to the control mechanism through a column of liquid under pressure to a second piston controlling the gun. Complicated mechanical systems of levers, bell-cranks, and the like were thus avoided, a simple water-tight pipe of small bore, which could be led by any convenient path, sufficing for the connection between gun and engine.

It is perfectly obvious that in effect the C.C. gun gear is a case of the transmission of power—albeit on a small scale—through a pipeline, and it is a fact that the system is capable of application to uses much more extensive than that of merely synchronising aircraft machine-guns.

The British rights in the Constantinesco system of power transmission by wave impulses through liquids are vested in the firm of W. H. Dorman and Co., Ltd., who have explored its possibilities in a very thorough manner and have developed a number of very important applications.

In the gun gear the case of the transmission and reproduction of a simple reciprocating motion was involved, and there are many similar problems of great industrial importance which call only for this. Among these may be classed such work as the operation of rock drills, coal cutters, riveting, chipping and scaling hammers, and to all these the wave impulse method of transmission lends itself admirably. For these purposes electricity and pneumatic and hydraulic transmission have hitherto been general. Of these, electricity involves the conversion of electrical to mechanical power, together with certain dangers, such as shock to the workers or of fire in the case of dangerous coal mines. Pneumatic transmission has in practice proved highly inefficient, partly owing to the difficulty of detecting and preventing leakage, particularly in the motors of the tools employed, and partly to less obvious causes; and hydraulic transmission labours under the disadvantage of the extreme weight of the tools and transmission lines necessary, which renders portable hydraulic tools practically impossible.

In the wave impulse system the maximum pressures in the pipelines are low as compared with hydraulic systems, and light flexible pipelines are possible. The tools are simple and devoid of valves, and there is no exhaust to dispose of or return. The overall transmission efficiency is claimed to be high—roughly comparable to that of electrical transmission—and it is believed that very great economies can be effected in the operation of tools of the types mentioned as compared with existing systems.

But the system is capable of even greater uses, for the energy of the wave impulses can be converted to rotary motion by very simple types of motor, or directly into heat energy, and may thus be used for any purpose for which electrical power transmission is suitable—except the direct production of light.

For full information as to the applications of wave power and as to the types of mechanism already developed for wave power operation, inquiries, mentioning THE AEROPLANE, should be addressed to W. H. Dorman and Co., Ltd., Stafford.

A Useful Wood-Working Machine.

In these days of severe competition and labour troubles it is absolutely necessary to have the aid of machinery to a more or less extent in all wood-working or wood-converting operations. It is also important that the machine or machines selected should be capable of doing that work which is most commonly required to be done with the utmost economy.

The "Premier" hand and roller feed surface planing, thicknessing, moulding, etc., machine, manufactured by J. Sagar and Co., Ltd., Canal Works, Halifax, makes, without a change of cutters, glue-joints, surfaces straight and taper work, wide or narrow, thin or thick; makes bevels, chamfers, stop-chamfers, corners, rebates; squares-up; planes edges at any angle to the side; thicknesses panels and boards; and does general planing from 1/16 in. to 9 in. thick at speeds varying from 15 to 32 ft. per minute. In addition, by adding suitable cutters (and without removing the planing cutters) the machine is suitable for sticking beads, sash material, and mouldings, tonguing and grooving, etc.

To many firms in a small way of business, and particularly to aircraft concerns who have been compelled to concentrate on the manufacture of furniture, coachwork, and other more peaceful products, this machine should prove a great advantage, as it is simple to operate, not liable to get out of order, whilst the variety of operations which it is capable of doing will put them on an equality with the larger manufacturers.

It must be understood that this machine is not an experiment, as it has been on the market for some years and thousands have been made and given satisfaction to hundreds of users. Naturally, countless improvements and modifications have been made to it, with the result that this machine has come to be recognised as the leader of its type.

The machine is made in four sizes to suit the requirements of various types of users. The four sizes take material up to 15, 20, 24, 30 in. wide and 9 in. thick.

To anyone interested, J. Sagar and Co., Ltd., of Canal Works, Halifax, will gladly forward booklets and catalogues dealing with this and other classes of wood-working machinery and tools, all of which are designed primarily for efficiency and economy.

Concerning Down-Draughts and Other Things.

A small booklet bearing the title, "Down-draught and its Cure," which recently appeared in the offices of this journal, was—on the strength of its possible bearing on the problems of soaring flight or of tail-plane design—immediately referred to the aerodynamical expert. Despite the fact that it proved to be concerned with the art of curing smoky chimneys, it did not find its way to the W.P.B., and for two reasons.

Firstly, the A.E. aforesaid is a family man and has been sore afflicted by these domestic pests; and, secondly, the Sankey chimneypot wherewith it deals shows distinct traces of intelligent aerodynamic design. On both counts it will undoubtedly have an appeal to numerous readers of this paper.

Accompanying this particular booklet there appeared a number of others—all published by the firm of J. H. Sankey and Son, Ltd., Essex Wharf, Canning Town, E., dealing with building materials, sanitary ware, fireclay and fire-bricks, and with Sankey's Pyruma fire-resisting cement. The latter two subjects are of direct interest to all readers of this journal who are professionally concerned with the production of castings, with the operation of furnaces for heating, steam-raising, the working and heat-treatment of metals, etc.; while the remainder may have at least a sentimental interest to all those who are engaged in wondering where all the bricks go at house-hunting times.

Another Brown Bros. Novelty.

Brown Bros., Ltd., who are notable for their business acumen in getting hold of new ideas which are at the same time clever and useful, have now acquired the selling rights of the "Apax" Sparking Plug Cleaner, which was recently illustrated and described in this paper. Briefly, the cleaner consists of a tube sealed at one end and screwed at the other end to take standard thread sparking plugs. Inside this tube are a number of very fine very hard steel wires with square-cut ends. The tube is half filled with petrol and the dirty plug is screwed into the end of the tube, which is then shaken vigorously up and down, so that the wires are driven into the interior of the plug, where they cut away the soot and dirt, which is then washed out by the petrol.

The retail price of the cleaner is 5s. 6d. For this small expenditure one can save quite a good deal of money, in that plugs which have been laid aside as useless can be made to work quite satisfactorily again with its help.

In recommending the Apax Cleaner, one does so from personal experience.

New Companies.

GREEN'S PATENT CO., LTD.—Private company. Registered Sept. 30th. Capital, £5,000 in £1 shares (2,500 "A" and 2,500 "B"). To carry on the business of manufacturers of and dealers in celluloid, artificial silk, aeroplane dope, films, and other articles and substances made out of cellulose dope, etc., and to adopt agreements (1) with R. Green and (2) with the Triplex Safety Glass Co., Ltd. The subscribers (each with one "B" share) are :—L. O. C. Hathaway, 90, Cavendish Road, South Side, Clapham Common, S.W., clerk; H. J. Carter, "Glaisdale," Markham's Lane, Woodford Green. The first directors are :—F. W. Kerr, P. J. Mitchell and R. Green. So long as the Triplex Safety Glass Co., Ltd., or its nominees hold 500 issued "B" shares, they may appoint two directors, the said F. W. Kerr and P. J. Mitchell being the first nominees. Solicitor :—W. A. Ward-Jones, 40, King Street, Cheapside, E.C.

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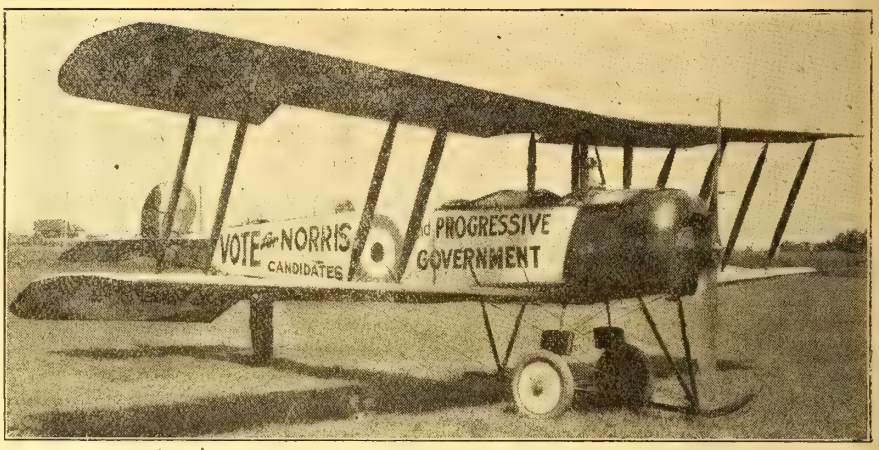
THE PROGRESS OF AVIATION IN CANADA.

AVROS IN CANADA.—The accompanying photograph shows an Avro belonging to the Canadian Aircraft Company, Limited, of Winnipeg, Canada. During provincial elections in Manitoba this machine was used in advertising the campaign for the Norris Party.

Besides flying all over the country carrying advertising matter, the machine took prominent Government officials from place to place, the longest individual trip being 400 miles for the out-and-home journey. The photograph was taken at the firm's aerodrome near Winnipeg.



[In the mass of surmise, promise and failure that serves in many a country for progress in aeronautics, the actual construcive work done by the Canadian Authorities during the past fourteen months stands out with distinction. That it has been unadvertised is evident from the lack of knowledge in Europe as to developments in Canada. To bring the official history of aviation in the Dominion up to the spring of this year, we print the Report of the Air Board for the Fiscal Year ending March 31st.]

REPORT FOR 1919-1920.

1. General.

The Air Board Act was assented to on the 6th of June, 1919, and by Order in Council dated the 23rd of June (P.C. 1295), the Honourable A. L. Sifton was named as Chairman of the Board, Colonel O. M. Biggar, Judge Advocate General, as Vice-Chairman; the Honourable S. C. Mewburn, Minister of Militia and Defence, as the representative on the Board of the Department of Militia and Defence; the Honourable C. C. Ballantyne, Minister of the Naval Service, as the representative on the Board of the Department of the Naval Service, and Dr. R. M. Coulter, C.M.G., Deputy Postmaster General, Mr. J. A. Wilson, Assistant Deputy Minister, Department of the Naval Service, and Mr. E. S. Busby, Chief Inspector of the Department of Customs and Inland Revenue, as the remaining members of the Board.

The Board was called together immediately, and considered the organisation of a staff. After consultation with the Civil Service Commission, it was decided that the work under the Board should be divided into three branches, having at their heads respectively a Superintendent of Flying Operations, a Superintendent, Certificate Branch, and a Secretary, the proposal being that the Secretary should administer the internal office organisation, that the Superintendent of Flying Operations should control all civil Government flying, and that the Superintendent of the Certificate Branch should conduct that portion of the administration which related to the public and was concerned with the licensing of personnel, aircraft and air harbours. The organisation thus outlined was formally communicated to the Civil Service Commission on July 15th, with a request that provision should at once be made for the appointment of these three officers and a medical officer for the Certificate Branch. No appointments were, however, made until after some time, and the first appointees assumed their duties as follows: On November 3rd, Lt.-Col. J. Stanley Scott, M.C., A.F.C., Superintendent, Certificate Branch; on Nov. 10th, Major A. M. Shook, D.S.O., D.S.C., A.F.C. and Croix de Guerre, Secretary, and Captain F. R. Smith, Medical Officer; and on December 15th, Lt.-Col. Robt. Leckie, D.S.O., D.S.C., D.F.C., Superintendent of Flying Operations

Permanent office accommodation was made available for the Board's staff only on the 24th of December.

2. Air Regulations.

The only step which, before the appointment of technical officers, it was possible to take in the direction of regulating and controlling aerial navigation was to prohibit dangerous flying. An Order in Council for this purpose was passed on July 7th (P.C. 1379). The drafting of a complete set of regulations was, however, proceeded with, and was completed in time for their submission to and approval by the Governor in Council on the 31st day of December. The *Canada Gazette*, containing the regulations, was published on the 17th of January, 1920, and at the same time there was ready for distribution a book containing not only the regulations, but also the forms settled for use under them, the Air Board Act and the Convention relating to International Air Navigation as drafted by a sub-commission constituted as part of the organisation of the Peace Conference and approved by the Supreme Council. This book has already had a wide distribution.

3. Preliminary Surveys for Operations.

In November steps were taken to have made a preliminary survey with a view to ascertaining what public services could more efficiently and, in the broadest sense, more economically be performed by air than by existing methods. Canada was, for this purpose, divided into four parts, and ex-Royal Air Force officers borrowed or temporarily employed for the purpose. The survey was completed by the end of the year, and on January 2nd these officers assembled at Ottawa and the situation was thoroughly canvassed, with the result that it was decided that the most favourable fields for the commencement of operations were the less thickly settled and less thoroughly explored portions of Canada. An interdepartmental conference was accordingly held on January 10th. An agenda for this conference, including memoranda on the probable cost of operating aircraft, and on their use for purposes of survey and for fire protection, was distributed, and a number of places were named as possible air stations, upon the utility of each of which discussion was invited. The usefulness of this preliminary conference was reduced by the non-participation of some of the departments which it was expected would be interested, but special discussions have since been carried on with those departments which were represented, and some others. Proposals have been formulated for operations next summer.

4. Scientific Research.

Among the duties imposed upon the Board is that of undertaking technical research for the development of aeronautics and of co-operating for that purpose with other institutions. In execution of this duty, discussions took place with the Honorary Advisory Council for Scientific and Industrial Research, which resulted in the formation under that Council of an Associate Air Research Committee, which held its first meeting on the 7th of February. Professor A. S. Eve, Professor of Physics at McGill University, was selected as Chairman of the Committee, and Mr. R. J. Durley, Secretary of the Engineering Standards Association, as its Secretary. Other members of the Committee are Professor J. C. McLennan, Professor of Physics at the University of Toronto, and Mr. J. R. Parkin, Lecturer in the Faculty of Applied Science in that University. This Committee will work in the closest co-operation with the officers of the Air Board, and will co-ordinate aeronautic research throughout Canada.

5. Meteorological Development.

The importance of meteorological information to air navigation cannot be over-estimated, and arrangements have been completed with Sir Frederick Stupart looking towards the necessary developments of the meteorological reports, the undertaking of meteorological observations at air stations operated under the Air Board, and the distribution of meteorological information.

6. Wireless Installations and Navigators' Certificates.

The development of air navigation will involve a considerable extension of wireless communication, and arrangements have been made with the General Superintendent, Government Radio Telegraph Service in the Department of Naval Service, for this purpose. Air pilots who require wireless qualifications will obtain them through that Department, by which will be issued licences for the necessary installations both in aircraft and on the ground. That department has an organisation extending throughout Canada, and duplication of officers is thus avoided. Like arrangements are expected to be made with the Department of Marine and Fisheries for

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EDUCATING THE ABORIGINES—Some North American Indians who, whilst attending the celebrations of the 250th anniversary of the Hudson Bay Company, visited the aerodrome of the Canadian Aircraft Co. at Winnipeg. They wore their native costumes, as can be seen, and came from distances of from 500-1,000 miles north of Manitoba.

the issue of navigators' certificates to air pilots who desire or need them. The existing organisation under that department extends throughout Canada and undertakes the examination and qualification of marine navigators. As the problems met with in air navigation are very similar to those which present themselves in marine navigation, this arrangement is expected to be both economical and satisfactory.

7. Aircraft and Equipment.

Negotiations have been entered into looking towards the taking over by the Air Board of the seaplane stations erected during the war by the Department of the Naval Service at Halifax and Sydney, and that portion of Camp Borden which was developed as an aerodrome by the Royal Air Force and acquired by the Department of Militia and Defence after the conclusion of the war. The equipment which will come under the control of the Air Board from these sources has an estimated value of $170,000. In addition to the aircraft and equipment thus acquired, sixteen machines, of an approximate value of $100,000, are being received from the Air Ministry by way of replacement of those presented from time to time during the war to the Canadian Forces through the activities of the Overseas Club, and the Imperial Government is also presenting to Canada aircraft and equipment of the value of about $5,000,000, including 80 aeroplanes, 14 flying boats, 12 airships, 6 kite balloons, with inflating plants and sheds, 300 motor and other vehicles, and a substantial amount of armament, wireless instruments, cameras, and other technical and general stores. A considerable part of this gift has already been shipped, and shipment of the remainder will not be long delayed.

8. Mapping

At the request of the Air Board, the Dominion Geographer has commenced the preparation of aeronautical maps on the system laid down in the Convention relating to International Air Navigation. The process of completing the mapping of Canada on this system will necessarily be a very long one.

9. Canadian Air Force.

The question of the constitution of a Canadian Air Force was an early subject of consideration by the Air Board, and on December 22nd there was adopted, for submission to Privy Council, a memorandum covering the general lines of the organisation proposed. A final decision on this subject was, however, postponed until the general policy with regard to Canada's future sea, land and air forces was determined, and it has consequently not been possible to take any further steps in this direction. The very large number of ex-officers and airmen of the Royal Air Force in Canada are expected enthusiastically to support the proposals if it is found possible to adopt them.

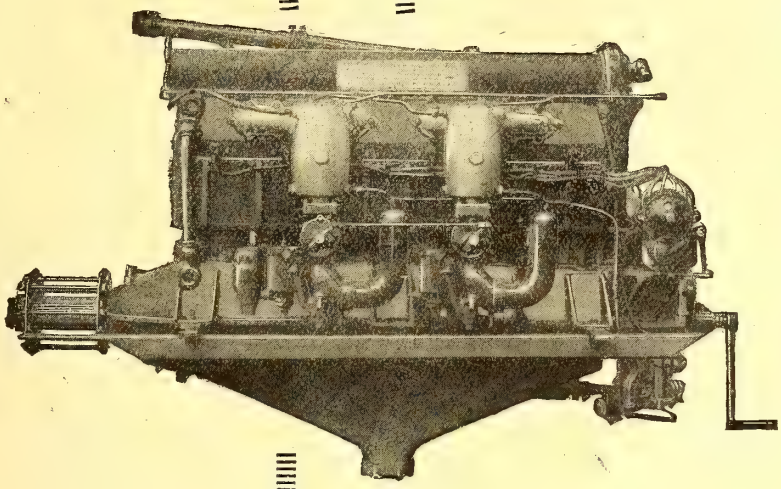
10. Aeronautic Intelligence.

The Air Board Act imposes upon the Board a duty "to study the development of aeronautics in Canada and other countries." In the execution of this duty the Air Board has had the advantage of the work done before its constitution by the Intelligence Branch of the Canadian Air Force under the Ministry of Overseas Military Forces of Canada. This Branch, during the two years of its existence in London, had collected material of very great interest and value, and its papers were, in the course of the demobilisation of the Canadian Expeditionary Force, transferred to the Air Board, which also secured the services of one of the officers chiefly responsible for its administration. The Air Board consequently has available fairly complete sets of drawings of almost all standard British machines, engines and equipment, with specifications for the construction of many of them, and has also an adequate collection of technical publications, reports and documents. The Intelligence Branch of the Canadian Air Force, O.M F.C., established communication with the chief aircraft manufacturing companies, and this communication has been maintained, with the result that the Air Board secures early information of developments in design and of inventions having an importance from an aeronautical point of view. With this material it is able to deal with the problems which present themselves to commercial and other companies, and which require solution in connection with operations undertaken on behalf of the Government.

31st March, 1920.

[Since the above Report was issued the Canadian Air Board has been reconstituted. The members are now as follows: Chairman, Mr. Guthrie, Minister of Militia; Vice-Chairman, Col. Biggar; Naval representative, Captain Walter Hose, R.C.N.; Civil Government Operations, Lt.-Col. R. Leckie, D.S.O., D.S.C.; Commercial Aviation, Lt.-Col. Scott; Air Force representative, Major-General Gwatkin, Inspector General Canadian Air Force; Interior Department representative, Dr. Deville, Surveyor-General.—Ed.]

One of the Canadian Curtiss biplanes used for pleasure flying and passenger conveyance by the Canadian Aircraft Co. of Winnipeg. The passenger in this instance is one of the Red Indians who appear in the preceding photograph. It is intended to use aeroplanes largely to open up quick communication with trading posts in the undeveloped portions of Canada.



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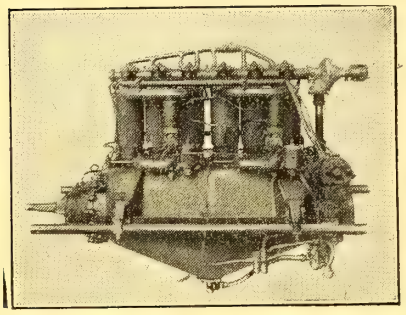

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CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line: next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; C. des G.E.A.—Compagnie des Grandes Expresses Aeriennes; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

OCTOBER 4th:

A.T.T., DH16, G-EAQS, London-Paris, 09.56-12.30, G.&M., 1, Tebbitt.
A.T.T., DH9, G-EAGY, London-Amsterdam, 10.15-12.20, G., Nil, Duke.
A.P.B., Westland, G-EAMV, London-Paris, 10.22-13.30, G., Nil, C. Orde.
K.L.M., Fokker, H-NABD, London-Amsterdam, 11.35-14.22, Nil, 2, Hinchliffe.
M.A., Breguet, F-CMAI, London-Paris, 12.05-14.29, G., Nil, Martel.
A.T.T., DH9, G-EAQL, London-Paris, 15.35-18.35, Nil, 1, Bamber.
A.T.T., DH9, G-EAQN, London-Paris, 15.50-18.40, G.&M., Nil, Lines.
A.T.T., DH16, G-EALM, Paris-London, 10.15-12.05, G., 4, Forson.
C.desG.E.A., Goliath, F-GEAC, Paris-London, 12.20-14.45, G., 3, Favreau & 1.
C.T., Nieuport, F-CGTI, Paris-London, 12.35-14.45, M., Nil, Mauler.
A.T.T., DH16, G-EASW, Amsterdam-London, 14.41-18.25, M., Nil, Milnes.
A.P.B., Westland, G-EAJL, Paris-London, 15.30-17.30, Nil, 3, McMullen.
A.T.T., DH16, G-EAQS, Paris-London, 15.40-17.20, G., 3, Robbins.

OCTOBER 5th:

A.T.T., DH18, G-EARO, London-Paris, 10.00-13.05, G.&M., 4, Forson.
C.T., Nieuport, F-CGTI, London-Paris, 12.24-15.45, Nil, Nil, Mauler.
A.T.T., DH9, G-EAQP, London-Amsterdam, 14.12-16.37, G., Nil, Carter.
A.T.T., DH9, G-EAQN, London-Paris, 14.15-16.50, G., 1, Shaw.
A.P.B., Westland, G-EAJL, London-Paris, 15.20-18.00, G., Nil, Powell.
A.T.T., DH18, G-EAUF, London-Paris, 15.35-18.30, G.&M., 5, Holmes.
A.T.T., DH9, G-EAQP, Paris-London, 10.00-11.50, Nil, 2, Tebbitt.
A.T.T., DH9, G-EAQN, Paris-London, 10.10-12.15, Nil, 2, Lines.
A.P.B., Westland, G-EAMV, Paris-London, 11.40-13.30, Nil, 3, C. Orde.
M.A., Breguet, F-CMAG, Paris-London, 12.15-14.30, Nil, 3, Le Sec.
M.A., Spad, F-CMAV, Paris-London, 12.55-14.48, G.&M., Nil, Bourdon.
A.T.T., DH9, G-EAGY, Amsterdam-London, 14.05-17.52, G.&M., 1, Duke
A.T.T., DH18, G-EARO, Paris-London, 15.30-17.27, G., 3, Forson.

OCTOBER 6th:

A.T.T., DH16, G-EALM, London-Paris, 09.40-12.30, Nil, 4, Milnes.
A.T.T., DH16, G-EAQS, London-Paris, 09.45-12.25, G.&M., 2, Tebbitt.
A.T.T., DH16, G-EAPT, London-Amsterdam, 10.10-12.45, G., 2, Reeves.
A.P.B., Westland, G-EAMV, London-Paris, 10.27-14.35, G., Nil, McMullen
C.desG.E.A., Goliath, F-GEAC, London-Paris, 11.20-15.10, G.&M., 2, Favreau & 1.
M.A., Breguet, F-CMAG, London-Paris, 12.25-15.45, G., Nil, Le Sec.
A.T.T., DH18, G-EARO, London-Paris, 15.35-18.30, G.&M., 5, Forson.
A.T.T., DH9, G-EAQL, Paris-London, 10.07-12.07, G., 2, Bamber.
C.T., Nieuport, F-CGTY, Paris-London, 12.25-14.40, M., Nil, Lasnes.
A.T.T., DH9, G-EAQN, Paris-London, 12.45-14.45, Nil, 1, Shaw.
A.T.T., DH9, G-EAQP, Amsterdam-London, 14.12-18.00, Nil, 1, Carter.
M.A., Breguet, F-CMAF, Paris-London, 14.30-16.49, G., Nil, Le Men.
A.P.B., Westland, G-EAJL, Paris-London, 15.15-17.20, G., Nil, Powell.
A.T.T., DH16, G-EALM, Paris-London, 15.25-17.30, Nil, 2, Milnes.
A.T.T., DH18, G-EAUF, Paris-London, 16.10-18.05, G., 4, Holmes.

OCTOBER 7th:

A.T.T., DH18, G-EAUF, London-Paris, 09.45-12.30, G.&M., 4, Holmes.
A.T.T., DH16, G-EALM, London-Paris, 10.02-12.40, Nil, 4, Lines.
M.A., Spad, F-CMAV, London-Paris, 10.03-15.00, Nil, Nil, Bourdon.
C.T., Nieuport, F.CGTY, London-Paris, 10.08-13.30, Nil, Nil, Lasnes.
A.T.T., DH9, G-EAPU, London-Amsterdam, 10.10-12.48, G., Nil, Duke.
M.A., Breguet, F-CMAF, London-Paris, 12.34-15.40, Nil, Nil, Le Men.
I.A.L., Bat, G-EAPK, London-Paris, 12.54-15.50, G., 1, Barnard & 1.
A.P.B., Westland, G-EAJL, London-Paris, 15.18-18.10, G., Nil, C. Orde.
A.T.T., DH9, G-EAGY, London-Paris, 15.30-18.10, G.&M., 1, Bamber.
A.T.T., DH18, G-EARO, Paris-London, 10.10-12.17, G., 2, Forson.
A.P.B., Westland, G-EAMV, Paris-London, 10.40-12.44, G., Nil, McMullen
A.T.T., DH16, G-EAPT, Amsterdam-London, 15.05-18.00, M., Nil, Reeves.
A.T.T., DH16, G-EAQS, Paris-London, 15.40-17.30, G., 2, Tebbitt.

OCTOBER 8th:

A.T.T., DH9, G-EAPL, London-Paris, 12.10-15.10, Nil, 2, Forson.
A.T.T., DH16, G-EAPT, London-Amsterdam, 12.40-16.05, G.&M., Nil, Carter
A.P.B., Westland, G-EAMV, London-Paris, 12.45-15.30, G., 2, Powell.
A.T.T., DH16, G-EAQS, London-Paris, 15.37-17.50, G.&M., 2, Tebbitt.
A.T.T., DH18, G-EAUF, Paris-London, 10.10-18.20, Nil, 4, Holmes.
A.T.T., DH9, G-EAQA, Amsterdam-London, —11.47, Nil, Nil, Hinchliffe.
C.T., Nieuport, F-CGTI, Paris-London, 12.20-14.35, M., Nil, Mauler.
A.P.B., Westland, G-EAJL, Paris-London, 15.25-17.30, G., Nil, Campbell Orde.
A.T.T., DH9, G-EAPU, Amsterdam-London, 14.42-18.13, G.&M., Nil, Duke.
A.T.T., DH9, G-EAGY, Paris-London, 15.30-17.27, Nil, 2, Bamber.
A.T.T., DH16, G-EALM, Paris-London, 15.30-17.35, G., 2, Lines.

OCTOBER 9th:

A.T.T., DH9, G-EAQL, London-Paris, 11.55-14.40, G.&M., Nil, Bamber.
A.T.T., DH16, G-EALM, London-Amsterdam, 12.00-15.25, G., 2, Lines.
C.T., Nieuport, F-CGTI, London-Paris, 15.10-18.15, Nil, Nil, Mauler.
A.P.B., Westland, G-EAJL, London-Paris, 15.12-17.51, Nil, 2, Courtney.
A.T.T., DH16, G-EAQS, Paris-London, 11.15-12.47, Nil, 4, Forson.
A.P.B., Westland, G-EAMV, Paris-London, 12.20-14.36, G., 1, Powell.
C.desG.E.A., Goliath, F-GEAC, Paris-London, 12.50-15.45, G., Nil, Favreau & 1.
I.A.L., Bat, G-EAPK, Paris-London, 13.30-16.10, G., 3, Barnard & 1.
A.T.T., DH16, G-EAPT, Amsterdam-London, 14.43-17.15, G.&M., 2, Carter.
M.A., Breguet, F-CMAF, Paris-London, 13.25-15.51, G.&M., Nil, Chailloux.
A.T.T., DH16, G-EAPM, Paris-London, 15.35-17.45, Nil, 3, Tebbitt.

OCTOBER 10th:

C.desG.E.A., Goliath, F-GEAC, London-Paris, 10.14-13.30, G., 1, Favreau & 1.
A.T.T., DH18, G-EAUF, London-Paris, 10.20-13.20, G.&M., 7, Holmes.
A.P.B., Westland, G-EAMV, London-Paris, 12.30-15.10, Nil, 2, McMullen.
M.A., Spad, F-CMAY, London-Paris, 13.37-15.40, Nil, 2, Bourdon.
Franco R., Potez, F-FRAA, London-Paris, 14.06-16.35, Nil, 3, Bajac.
H.P.T., SE5, G-EATE, London-Brussels, 15.20—, Nil, Nil, Foot.
C.T., Nieuport, F-ICGT, London-Paris, 15.48—, M., Nil, Le Comte.
M.A., Spad, F-CMAY, Paris-London, 10.57-13.10, Nil, 2, Bourdon.
Franco R., Potez, F-FRAA, Paris-London, 10.48-13.17, Nil, 3, Bajac.
C.T., Nieuport, F-ICGT, Paris-London, 10.45-15.29, M., Nil, Le Comte.
A.T.T., DH9, G-EAPL, Paris-London, 13.35-15.58, G., 1, Bamber.
A.P.B., Westland, G-EAJL, Paris-London, 15.30-17.45, G., 3, Courtney.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

OCTOBER 4th:

H.P.T., HP, G-EASY, London-Paris, 12.35-17.00, Nil, 7, Hope & 1.
H.P.T., DH4a, G-EAVL, Amsterdam-London, —14.55, G.&M., 1, Foot.
H.P.T., DH9, G-EATA, London Brussels, 14.45—, G.&M., Nil, Halliwell.
H.P.T., DH9, G-EAUC, London-Amsterdam, 14.50-17.10, G.&M., 2, Wilcockson.
H.P.T., HP, G-EATJ, Paris-London, —15.05, Nil, 4, Bager & 1.
H.P.T., DH4a, G-EAVL, London-Paris, 15.45-18.40, Nil, 1, Fowler.
S.N.E.T.A., Goliath, O-BLAN, Brussels-London, 14.45-11.40 (5th, landed at Hendon 4th), G.&M., 1, George & 1.

OCTOBER 5th:

H.P.T., H.P., G-EALX, London-Paris, 12.30-17.14, G., 4, McN. Davies & 1
H.P.T., HP, G-EASM, Paris-London, 10.00-12.35, G., 2, McIntosh & 1.
H.P.T., DH9, G-EAUC, Amsterdam-London, —13.35, G.M., 1, Wilcockson
H.P.T., DH9, G-EAUP, London-Amsterdam, 15.40—, G.&M., Nil, Capps.
S.N.E.T.A., Goliath, O-BLAN, London-Brussels, 15.18-18.55, G.&M., 2, George & 1.
H.P.T., DH4a, G-EAVL, Paris-London, 12.20-14.25, Nil, 2, Fowler.
H.P.T., HP, G-EASY, Paris-London, 12.55-15.23, G., 0, Hope & 1.
H.P.T., DH9, G-EATA, Brussels-London, 15.15-17.45, G.&M., 1, Halliwell.

OCTOBER 6th:

H.P.T., HP, G-EATM, London-Paris, 12.12-17.00, G., 5, Beal & 1.
H.P.T., DH9, G-EAUP, Amsterdam-London, 10.40-14.20, M., Nil, Capps.
H.P., DH4, O-21, London-Brussels, 15.14-17.45, G.&M., Nil, Olley.
H.P.T., DH4a, G-EAVI, London-Amsterdam, 14.53-17.23, G.&M., 1, Foot.
S.N.E.T.A., DH4, O-BABI, Brussels-London, 14.30-17.03, G.&M., 1, Briere.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 14.30-17.05, Nil, 2, Delzenne

OCTOBER 7th:

H.P.T., HP, G-EATJ, London-Paris, 12.18-16.00, G.&M., 3, Bager & 1.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 09.33-13.18, G.M., Nil, Foot
H.P.T., DH9, G-EAUC, London-Amsterdam, 14.40-17.10, G.&M., Nil, Wilcockson.
S.N.E.T.A., DH4, O-BABI, London-Brussels, 14.48-12.45(8th) Nil, 1, Briere
S.N.E.T.A., DH4, O-BARI, London-Brussels, 14.48-10.25 (8th), G.&M., Nil, Delzenne.

H.P.T., HP, G-EATM, Paris-London, 12.15-15.10, Nil, 8, Beal & 1.
H.P.T., DH9, G-EAUN, Brussels-London, 16.40-18.25, G.&M., Nil, Olley.

OCTOBER 8th:

H.P.T., HP, G-EATH, London-Paris, 12.15-16.05, G &M., 6, Halliwell & 1
H.P.T., DH9, G-EAUC, Amsterdam-London, —12 16, GM, Nil, Wilcockson
H.P.T., DH9, G-EAUP, London-Brussels, 14.57-17.35, G.&M., 1, Hope.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.45—, G.&M., 1, Foot.
H.P.T., HP, G-EATJ, Paris-London, 12.30-15.23, G., 8, Bager & 1.
S.N.E.T A., DH4, O-BALO, Brussels-London, 14.45-16.45, G.&M., Nil, Rigaud.

OCTOBER 9th:

H.P.T., HP, G-EASY, London-Paris, 12.12-15.55, G., 3, Olley & 1.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 09.40-12.50, G.M., Nil, Foot
S.N.E.T.A., DH4, O-BALO, London-Brussels, 14.33-17.30. G.&M., 1, Rigaud
H.P.T., DH9, G-EAUC, London-Amsterdam, 14.35—, G.&M., Nil, Capps.
H.P.T., HP, G-EATH, Paris-London, 13.00-16.15, G., 2, Halliwell & 1.
H.P.T., DH9, G-EAUP, Brussels-London, 14.40-16.45, G.&M., 2, Hope.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 15.40-17.50, Nil, 2, Delzenne

OCTOBER 10th:

H.P.T., HP, G-EASY, Paris-London, 12.30-16.00, Nil, 8, Olley & 1.
S.N.E.T.A., DH4, O-BARI, London-Brussels, 11.50-15.20, Nil, Nil, Delzenne.

Inland Flying at Croydon.

Oct. 4th.—A.T.T., Ltd., D.H.18, one test; K.L.M. Fokker from Cricklewood.
Oct. 5th.—R.A.F. Bristol, Kenley return; D.H.9a, Kenley return.
Oct. 6th.—A.T.T., D.H.18 one test, D.H.9 one test; I.A.L., "Vimy," photography; Bat, one test.
Oct. 7th.—A.T.T., D.H.9 two joy-rides; R.A.F. Bristol, Kenley; I.A.L. Bat, one test.
Oct. 8th.—Nil.
Oct. 9th.—A.T.T., D.H.16 one test, D.H.9 one joy-ride; I.A.L. "Vimy," joy-ride.
Oct. 10th.—I.A.L. "Vimy," three joy-rides; H.P.T., Ltd., one S.E.5 from Cricklewood.

Inland Flying at Cricklewood.

Oct. 4th.—K.L.M. Fokker to Croydon.
Oct. 5th and 6th.—Nil.
Oct. 7th.—H.P.T. Handley Page test.
Oct. 8th.—H.P. D.H.4 test.
Oct. 9th.—Aerofilms, Avro from Birmingham; H.P.T. D.H.9 to Kings North.
Oct. 10th.—Aerofilms, Avro to Hendon; H.P.T. S.E.5 to Croydon.

Air Port Statistics.

MACHINES:—			
Croydon	88	Cricklewood 43	Total 131
PERSONNEL—Passengers:			
Croydon	133	Cricklewood 89	Total 222
Crews:			
Croydon	94	Cricklewood 58	Total 152
Total Passengers and Crews			374

The London Terminal Aerodrome.

One of the busiest weeks since the aerodrome was taken over. Though the days are getting shorter, the number of passengers shows no sign of falling off: rather the reverse.

All the British air lines have their hands full. A. T. and T. will probably alter the time of departure of their afternoon service so as to complete their journey in daylight in winter.

The Instone Air Line are very glad to have the "Bat" again on the service.

Among the passengers to Paris and back during the week-end by the Air Post of Banks were Sir Frederick Sykes and Brig.-Gen. Festing, who had Mr. Courtney as pilot. Owing to the recent bad weather and low clouds, Mr. Courtney says that his wings are getting quite worn out on the telegraph wires!!!

One of the prettiest sights one has seen for a very long time was the arrival of the "Goliath" on Saturday. He arrived at a height of between 2,000 ft. and 3,000 ft. and came down with a long, slow glide, executing some very nice turns and judging his landing splendidly.

Of the "binge" on Sunday, more will be found elsewhere

One noticed a mechanics' box in the shed at Croydon on which were the words, "William Beardmore and Co., Croydon." This looks as though the Beardmore Air Line were being permanently installed.—G. D.

Longest Purely Commercial Flight.

The greatest purely business flight yet carried out was completed on the 11th on the arrival of the D.H.9 aeroplane G-EAUI at Cricklewood Aerodrome at 12.15. Mr. R. Wright, managing director of Messrs. Nasmyth, Wilson and Co., having urgent business in the Rumanian capital, hired the machine from the LepAerial Travel Bureau for a flight to Bukarest.

He left London on Sept. 12th and arrived in Bukarest on Sept. 16th, delay being caused in Belgrade by the Serbian War Office, who mistook the travellers for Bolshevik envoys. During a stay of nearly a month Mr. Wright transacted business, retaining the machine to return as soon as possible. On Saturday he left Bukarest, spent the night in Vienna, continued on Sunday to Strasbourg in one flight, and on the 11th completed the journey to London without landing, covering the 420 miles from Strasbourg to London in 3 hours 55 min. The return journey from Bukarest was made in only 12 hours' actual flying time.

Both Mr. Wright and his pilot, Mr. Perry, were very pleased with their flight, which was the first between the two cities. The journey from Bukarest, which occupied only 2½ days, would have, by rail and boat, occupied at least 5 days.

Reduction in Freight Rates

On and after Friday, Oct. 1st, 1920, the freight rates for goods carried on the Handley Page Air Services between London-Paris and London-Brussels and *vice versa*, will be further reduced as follows:—

From London:—Up to 100 lb., 1s. 3d. per lb; over 100 lb., 1s. per lb.; minimum, 2s.

To London:—Up to 50 kilo., 7 fr. per kilo; over 50 kilo., 6 fr. per kilo; minimum, 5 fr.

Gloucester.

On Sept. 24th the Berkshire Aviation Co. began flying at Castle Meads, in conjunction with the famous Barton Fair. Passenger-flights became popular immediately, some four hundred people being carried during the first six days. Capt. Robinson—who was piloting the company's Avro machine—was busy from morning till dusk, and on Sunday twenty people from the fair ground looped the loop in succession.

Messrs. Taylor and Holmes walked the wings over the fair on Saturday and thousands of people immediately flocked onto the aerodrome—evidently preferring aerial stunts to the less exciting pastime of hoop-la and fortune-telling. Free flights have been given in connection with the *Gloucester Citizen*.

On Saturday the Berkshire Aviation Co. leave Gloucester for King's Heath, Birmingham, where they will fly in conjunction with Messrs. Holmes and Jones for a period of two weeks.

Brooklands.

A series of thefts from aircraft stores on Brooklands aerodrome have taken place recently Over a week ago more than forty aeroplane watches disappeared mysteriously, there being no evidence of forcible entrance to the building in which they were stored.—J. F. S.

FOREIGN INTELLIGENCE.

FRANCE.

A correspondent in France writes:—

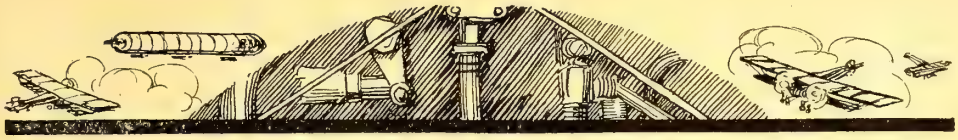
Air Posts of Banks.

You will be pleased to learn that the Westland machines have more than covered their expenses on this first fortnight's working. Courtney is just wonderful at getting through.

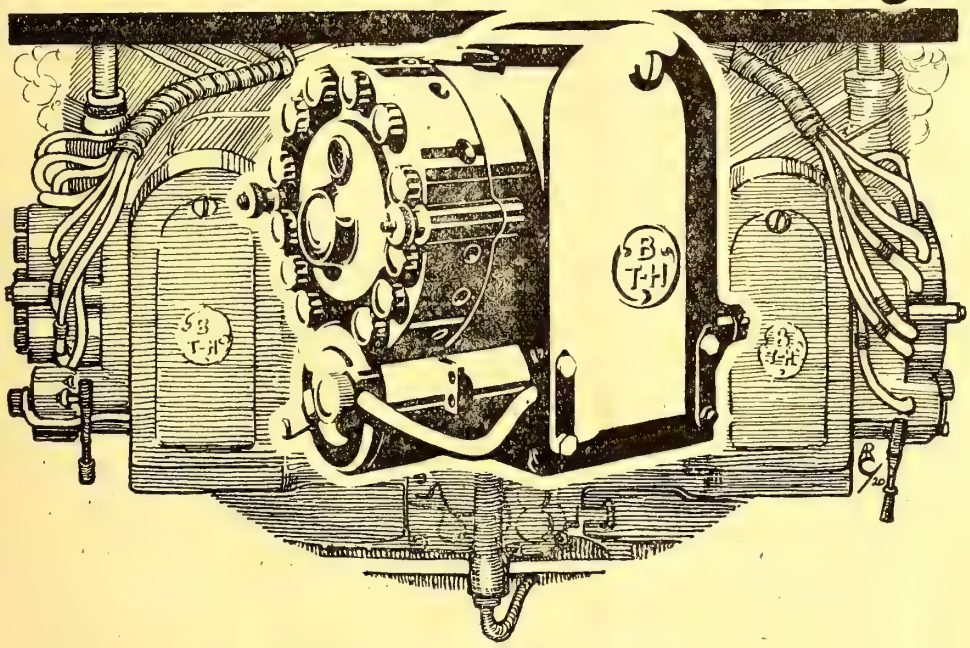
The A.P.B. have working arrangements with the Messageries Aeriennes and Grands Express Aeriens, thus making a very solid group, and no passenger can ever be let down completely, not even during the winter.

Complaints.

It was really too funny when passing over Lympne on Sunday (Sept. 26th) in the fog, to see all the little black ant-like dots rush out and put a lot of big letters on the ground backwards so that we could not read them. On walking to the back door of the Farman I found that they were C33, etc., referring to the land side instead of the Channel, which was



Reliability



B.T.H. Magnetos at Martlesham Heath, Air Ministry Trials.

Large Aeroplane Class.

First Prize - Not awarded.

Second Prize - Handley Page. Napier "Lion" Engine fitted with B.T.H. Magnetos.

Small Aeroplane Class.

First Prize - Westland Six-Seater. Napier "Lion" Engine fitted with B.T.H. Magnetos.

Second Prize - Sopwith "Antelope." Wolseley Hispano "Viper" Engine fitted with B.T.H. Magnetos.

B.T.H. - **the Quality Magneto.**

The BRITISH THOMSON-HOUSTON CO., LTD.

Lower Ford Street. :: :: :: :: :: Coventry.

Member of the British Ignition Apparatus Association.

B T-H

our direction. Very useful that. Being Sunday and ahead of time, we went for a little "Balade" along the Seine, and even then arrived before the wireless notification of our departure from Croydon. Such is our boasted British organisation in Commercial Aircraft.

A New Spad.

The new Spad 9-passenger machine for the Napier engine is in hand, and is likely to be interesting. As you know, the Spad monocoque fuselages are some 700 lb. lighter than a corresponding trussed construction of another make, which means so much extra commercial load possible for the same speed and engine. The corresponding six-passenger machine for the 300-h.p. Salmson engine is ready for tests.

A Besson Seaplane.

M. Besson is starting the construction of a four-engine (300 Salmsons) boat seaplane for passenger-carrying which is likely to be good.—E. N.

The Buc Tourney.

The Buc aviation meeting, which took place during the week 4th-10th Oct., was the outstanding French aviation success of the year and seems to rank second in popularity only to the R.A. F. pageant at Hendon. The Buc-Brussels and Buc-London races were the events of the meeting.

M. Thierry, on a Breguet, won the "Concourse of dexterity and address." The world's speed record was broken by de Romanet, on a Spad. He attained a speed of 292 km. 680 m. per hour. Sadi-Lecointe subsequently beat this performance by 1 km. per hour, but as the F.A.I. rules state that a speed record has to be exceeded by 4 km.p.h. to be homologated, de Romanet's record stands. If Sadi had started first he would have held the record.

GERMANY.

The Danish correspondent of The Aeroplane writes :—

During the Frankfurt/Main fair the Deutsche Luft-Rederei, Sablatnig and Rumpler all compete on special Berlin-Leipzig-Frankfurt services. The Lloyd Air Service, Bremen, has further a Rumpler Munich-Frankfurt and a Balug Basel-Frankfurt service.—E. H.

German Meteorological Aerial Report Service.

To help the fostering of German and international air traffic the Prussian aeronautical observatory at Lindenberg issues three times a day "News for Pilots" through the Königswusterhausen wireless station, containing the altitude and wind registrations of the stations Swinemünde, Manchester, Felixstowe, Paris and Prague. Other information of importance for flying on the different routes, such as the temperature at altitudes, and about clouds and visibility is also given in the figures of aerological observations, the code for which can be had gratis on request.

The sending times are 07.06, 11.00, and 16.50 o'clock, or in case of trouble 11.25 and 17.10, on 3,200 and 2,500 metres continuous wave length. Call signal L P.

The report of Sept. 9th is given as a specimen, containing in figures the temperature, the moisture degree and wind velocity of Lindenberg up to 3,000 m., of Friedrichshafen up to 3,100 m., and of Seerappen till 1,900 m. Further, the wind registrations of the stations above. Information can always be had over the telephone; call, Beeskow 40.

The Keeping of German Sheds.

The negotiations of the German Government with the Allies have resulted in the permission to rebuild two flying sheds and the works at Gotha for industrial purposes, which should have been taken down according to the Versailles Peace Treaty.

Research Work of German Aircraft Manufacturers.

Germany's first pilot, Hans Grade, who during the war sold his aeroplane and two-cycle aero engine works at Bork to the Automobil and Aviatik Co. as a branch has just had an experimental limited company formed. And the German Stahlherz rotary engine manufacturer, Otto Schwade, at Erfurt advertises for soaring flight exponents or glider designers.

German Recognition of McCudden.

The German aero journal, *Illustrierte Flug-Welt*, of Leipzig, publishes in its last two issues extracts from Major McCudden's honourable flying career, the passages from his book of the Voss fight and his opinion of the German pilots being translated.

20,000 German Aero Engines Destroyed.

The Berlin paper, *Berliner Zeitung am Mittag*, contained recently the following advertisement :—"Destroyed aeroplane, seaplane and airship engines of different German makes for sale in quantities of 1,000 to 20,000. The engines have been rendered useless and must be destroyed further by rendering the crankshafts, crankcases, cylinders, pistons, connecting rods and bearings, push rods, valve gears and carburetters useless according to and satisfying the instructions of the Inter-Allied Aeronautical Commission of Control. All offers must be handed in before Sept. 1st, 1920. Description of how the destroying is to be carried out can be had from the address : Bureau de Liquidation du Matériel de Guerre, Berlin, S.W.11, Königgrätzer Strasse 30."

The Aeroplane Carries its own Shed.

The new Sablatnig parasol limousine monoplane, of Bat F.K.26 fuselage outlines, that was described in The Aeroplane of May 12th, has now been tested out in actual service. As an innovation can be mentioned that this C.3 model carries its own tent, which weighs 30 kg. of the 1,000 kg. useful load, and when the planes are folded along the body, rests on the leading edges and the propeller tip.

ITALY.

The Italian correspondent of The Aeroplane writes :—

The Failure of the Weather.

The execrable weather conditions with persistent relapses have put a stop to most pleasure-flying and a lot of useful work. The only event of interest is the arrival of Maddalena, whose doings and troubles in Switzerland were here mentioned early in September, at Riga, whence he was to proceed to Reval and Helsingfors to deliver the big S.9, the first of a batch purchased by Finland. The flight of 4,000 km. *via* Germany, Holland, Denmark, Sweden—and, of course, Switzerland, as already reported—has been accomplished so far in six stages.

A Restoration of Flying.

Owing to the improved political conditions flying in the provinces of Milan and Turin is again permitted to all and sundry licensed pilots.

A Co-operative Society.

The most important event of the week has been the meeting held at Milan of the personnel essential to aerial navigation, viz., pilots, motorists, fitters, and designers, to form a co-operative trading concern. The members' shares are of 100 lire each, but some half a million lire were announced as having been advanced to the co-operative by a financier. All profits accruing from the employment of these sums will be divided between members. A similar concern is nearly under way amoug the Roman flying people. With so many pushers Italian aviation seems bound to get moving efficiently

The Fiat Soviet.

Some excitement on 'change was caused by the rumour—based on solider foundations than some such—that the Fiat was to be run by the workers for the workers. Later reports seems to give it as a fact that the directors' offer to this effect has not been accepted by the men, who rather funk starting to put their theories into practice on such a big concern.

Supplies to Finland.

The departure of some more S.16s for Helsingfors is imminent. Meanwhile, after a journey of 14 hours, a land-going machine has reached Posen from Turin with two on board, the distance being, it is claimed, 2,300 kilometres, the weather as bad as it is now generally.

The Forlanini Airship.

On her way to propagate the desirability of aerial travel Forlanini 6 had an accident to her steering gear and had to land and do a night out near Gallarate a few days back. The 25 passengers, being mostly business men, were thus landed close to industrial centres to visit which, unexpectedly, may not, one hopes, have been fruitless.—T. S. H.

SIR FREDERICK SYKES ON CIVIL AVIATION.

At the Royal Society of Arts on Oct. 8th, Major-General Sir Frederick Sykes, G.B.E., K.C.B., lectured before the Royal Aeronautical Society on "Civil Aviation." Mr. Illingworth, the Postmaster-General, was in the chair. The lecturer outlined existing conditions in regard to commercial aeronautics and said that safety and reliability were the main factors of success in aerial transport. In regard to the desirability of discovering a fuel for aircraft less dangerous than petrol he said that "many of us tend to think that steam may one day come into its own in place of the petrol engine."

He said that Wm. Beardmore and Sons, Ltd., proposed to run an experimental mail service between London and Glasgow.

In the discussion that followed, the Lord Montagu of Beaulieu thought that the Postmaster-General should assist civil aviation, and Mr. Handley Page said that Government financial assistance was absolutely necessary.

The Postmaster-General did not agree that the postal service governed the future of commercial aviation, as he thought mails would always be auxiliary cargo to the carriage of passengers and goods. Steamship lines and railways could not exist by mails alone. Air mails were increasing rapidly and he was glad of it, and would do all in his power to assist.

He did not think Government subsidy desirable, as that implied Government control, and Government control was the broadest and surest road to bankruptcy yet devised.

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THE ROYAL AERONAUTICAL SOCIETY.

WEEKLY NOTICES.

LECTURES.

Sir Humphrey Rolleston, K.C.B., late President of the Royal College of Medicine, will take the chair at Wing Commander Flack's paper on "The Human Machine in Relation to Flying" on Nov. 4th.

The lecture on "Airship Mooring" will be read on Dec. 2nd by Flight Lieut. F. L. C. Butcher.

Major-General Sir F. H. Sykes, G.B.E., K.C.B., read the inaguural paper of the fifty-sixth session at the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m on Thursday, Oct. 7th. The Postmaster-General (Right Hon. A. H. Illingworth, M.P.) was in the chair.

At the next meeting, on Oct. 21st, two papers will be read: "A Comparison of the Flying Qualities of Single and Twin Engined Aeroplanes," by Sqdn. Leader R. M. Hill, Associate Fellow; and "Night Flying," by Mr. Cecil Baker. Major-General Sir W. S. Brancker, K.C.B., will be in the chair.

JOURNAL.

The October issue of the Journal, which is now available, contains an original paper of great interest to engineers in general, as well as the aeronautical profession—particularly those using F.S.W. ropes in mining or other industries. It has been prepared by Mr. Walter Scoble as an account of his research work on wire ropes at the East London College. An important paper by Mr. Harris Booth on "The Design of Spars with Offset Pin-Joints" is also included in the same issue.

AIR CONFERENCE.

The paper on "Technical Aspects of Service and Civil Aviation" at the Air Conference will be read on behalf of the Society by Captain F. S. Barnwell, Fellow, at 5 p.m. on the second day, Wednesday, Oct. 13th.

A very limited number of tickets for the Conference have been received from the Air Ministry, which are in the first instance being offered to Fellows of the Society. If any technical member desiring to take part in the discussion on any particular paper will apply to the Secretary, efforts will be made to arrange for a special ticket. Owing to the extremely limited accommodation which is understood to be available, it is feared that it will be impossible to obtain tickets for any members other than those intending to speak.

EARLY CORRESPONDENCE.

The Secretary's researches into old correspondence in the office have revealed a large number of autograph letters from early pioneers and others, many of which are of extreme interest as bearing upon the history of the Society. Among them are letters from Sir Edwin Arnold (as Member of the Council), Henry Coxwell, Thomas Moy, Sir Hiram Maxim, Octave Chanute, Wilbur and Orville Wright, Robert Cocking, Santos Dumont, Major Moedebeck, Major Parseval, Count Zeppelin, Percy Pilcher, Lawrence Hargrave, and many others.

W. LOCKWOOD MARSH,
Secretary.

Oct. 1st, 1920.

DRAUGHTSMEN.

The Secretary has been informed of a vacancy in an aeronautical drawing-office for an experienced draughtsman at a commencing salary of £300 per annum. Any member desirous of applying for the post should forward his name to the Secretary by letter, together with full details of his experience and copies of testimonials.

ANNUAL DINNER.

Owing to the difficulty of finding accommodation, it has been found necessary to postpone the annual dinner until November. A definite announcement as to date and place will be made shortly.

FORTHCOMING ARRANGEMENTS.

It is hoped shortly to be able to announce an addition to the lecture programme in the shape of a paper describing certain experiments which have been carried out in the direction of producing a practical direct-lift heavier-than-air machine. This is a matter which has in the past been the subject of many papers read before the Society, and it is hoped that the paper and discussion will result in the dissemination of the latest information in this particular line or research.

LIBRARY.

The following books have been received and placed in the Library: "The Struggle in the Air, 1914-1918," Charles C. Turner; "Design of Aeroplane Engines," John Wallace; "English-French Aero Dictionary," Leonard Henslowe.

W. LOCKWOOD MARSH,
Secretary.

Oct. 8th, 1920.

THE ROYAL AERO CLUB.

FINANCE COMMITTEE.

A Meeting of the Finance Committee was held on Wednesday, Sept. 22nd, 1920, when there were present Mr. J. H. Nicholson, in the Chair, Lieut.-Col. F. K. McClean and the Secretary.

HOUSE COMMITTEE.

A Meeting of the House Committee was held on Monday, Oct. 4th, 1920, when there were present Mr. Ernest C. Bucknall, in the Chair, Major H. Graeme Anderson, Mr. Herbert J. Corin, Mr. Henry Knox, Lieut.-Col. F. K. McClean, and the Secretary.

COMMITTEE MEETING.

A Meeting of the Committee was held on Wednesday, Oct 6th, 1920, when there were present Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Major-Gen. Sir Sefton Brancker, K.C.B., Mr. Ernest C. Bucknall, Lieut.-Col. Spenser D. A. Grey, D.S.O., Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. F. K. McClean, Lieut.-Col. Alec Ogilvie, Lieut.-Col. Mervyn O'Gorman, C.B., and the Secretary.

HOUSE COMMITTEE.—The report of the Meeting of the House Committee held on Oct. 4th, 1920, was received and adopted.

ELECTION OF MEMBERS.—The following New Members were elected:—Archibald John Curry; Norman Gordon Stewart-Dawson; Archibald James Greenshields; Flight-Lieut. William Arthur Skeate, R.A.F.

LIFE MEMBERSHIP.—The following were elected Life Members:—Capt. C. B. Bond, The Lord Foley.

The following Resolution was unanimously passed:—

"Resolved that from this date the Compounding Fee for Life Membership be Seventy Guineas."

FINANCE COMMITTEE.—The report of the Meeting of the Finance Committee held on Sept. 22nd, 1920, was received and adopted.

AIR CONFERENCE.—The following were appointed to represent the Club at the Air Conference to be held at the Guildhall, London, on Oct. 12th, 13th, and 14th, 1920:—

Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Major-Gen. Sir Sefton Brancker, K.C.B.; Air Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; Lieut.-Col. Mervyn O'Gorman, C.B.; Mr. Howard T. Wright.

PARIS-LONDON-PARIS RACE FOR TRANSPORT MACHINES.—The details discussed with the Aero Club de France were reported and the Secretary was instructed to make arrangements at Waddon Aerodrome, Croydon, for the supply of petrol, ballast, etc. The following officials were appointed to represent the Club at Croydon and Paris:—

Croydon:—Brig-Gen. Sir Capel Holden, K.C.B., F.R.S.; Wing-Commander W. D. Beatty, C.B.E., A.F.C., R.A.F.; Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.,; Lieut.-Col. F. K. McClean; Mr. H. E. Perrin, Secretary; M. B. Stevenson, Assistant Secretary.

Paris:— Lieut.-Col. W. A. Bristow; Major R. H. Mayo.

FLYING MACHINES FOR THE USE OF MEMBERS.—The Secretary reported the present position in regard to the machines acquired for the use of the Members

GORDON BENNETT AVIATION CUP, 1920.—The report of the Club Officials who attended the Gordon Bennett Race at Etampes was received, and it was decided to vote a sum of Two Hundred Guineas to Mr. F. P. Raynham in recognition of his very sporting effort to win the Cup for Great Britain.

A vote of thanks was passed to Lieut.-Col. F. K. McClean, Lieut.-Col. Mervyn O'Gorman, C.B., Lieut.-Col. W. A. Bristow, and Mr. R. J. MacGeagh-Hurst for the assistance rendered by them to the British Competitor at Etampes.

AVIATORS' CERTIFICATES.—The following Aviators' Certificates were granted:—

7885 Harold Stunde (Esthonian subject); 7886 Leo Janv (Esthonian subject); 7887 Richard Teiman (Esthonian subject); 7888 Carl Fiscar (Esthonian subject); 7889 Jacob Tillo (Esthonian subject); 7890 Konstantin Kursmann (Esthonian subject); 7891 Paul Paev (Esthonian subject); 7892 Frederick Ellam; 7893 Harold James Ellam; 7894 Jose Cabral (Portuguese subject); 7895 Archibald James Greenshields; 7896 Marion Hughes Aten; 7897 George Fredrick Tetley; 7898 William Pool; 7899 Nikolai Tuimann (Esthonian subject); 7900 Christian Ernest Pitman.

COMING EVENTS.

OCTOBER.

Tues., 12th, Wed., 13th, Thurs., 14th.—Air Ministry Air Conference in London.

16th, Sat.—No. 4 Squadron Dinner at 8 p.m. at Savoy. Particulars from Lt.-Col. Carthew, 2, Mitre Court Buildings, Temple, E.C.4.

21st, Thurs.—R.Ae.S. lecture. "A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Sqdn. Ldr. R. M. Hill, R.A.F.* "Night Flying," by Cecil Baker.

23rd, Sat.—Gordon Bennett Balloon Race at Indianapolis.
International Aero Exhibition, Prague, opens.
73rd Wing, R.A.F., Reunion. Particulars from Mr. C. F. H. Bloom, 17, Welbeck Street, W.1.; or Mr. Leonard Bridgman, c/o THE AEROPLANE, 175, Piccadilly, W.1.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes.

2nd, Tues.—International Aero Exhibition, Prague, closes.

4th, Thurs.—R.Ae.S. lecture. "The Human Machine in Relation to Flying," by Col. Flack.*

18th, Thurs.—R.Ae.S. lecture. "The Design of Aeroplane Control Surfaces, with Special Reference to Balancing," by H. B. Irving, "Airscrews," by A. Fage.*

DECEMBER.

2nd, Thurs.—R.Ae.S. lecture. "Airship Mooring," by Flight Lt. F. L. C. Bitcher, and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.*

16th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Instalment of Aeroplane Engines," by A. T. Rowledge.*

JANUARY—1921.

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr H. W. S. Outram.*

17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

MARCH—1921.

3rd, Thurs.—R.Ae.S. lecture. "Airship Fabric," by J. W. W. Dyer. "Parachutes," by Major T. Orde Lees.*

17th, Thurs.—R.Ae.S. lecture "Flying-Boat Construction," by Capt. D. Nicolson.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30.

MORTGAGES, CHARGES & SATISFACTIONS.

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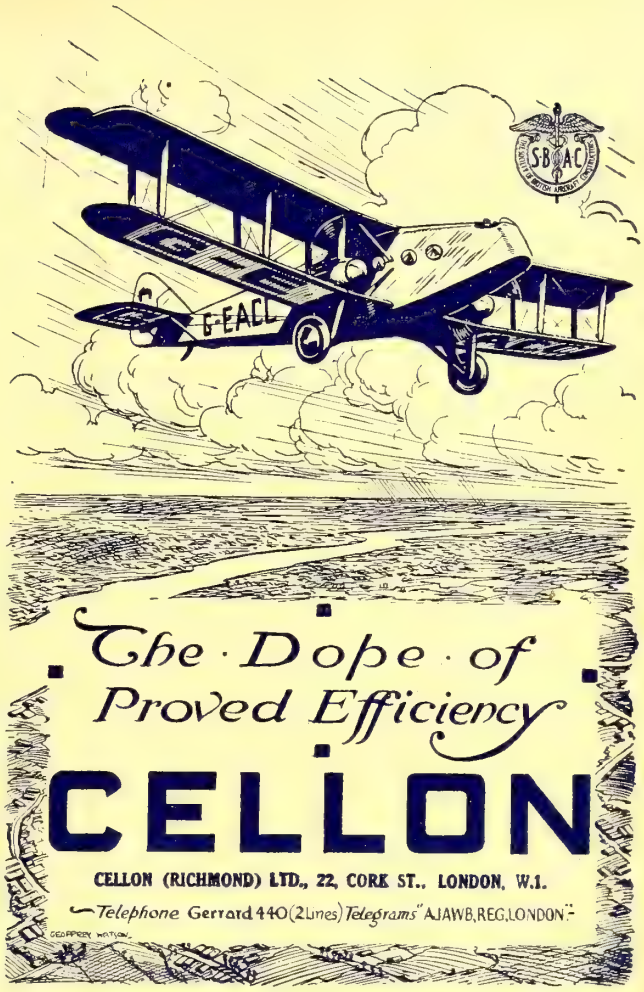

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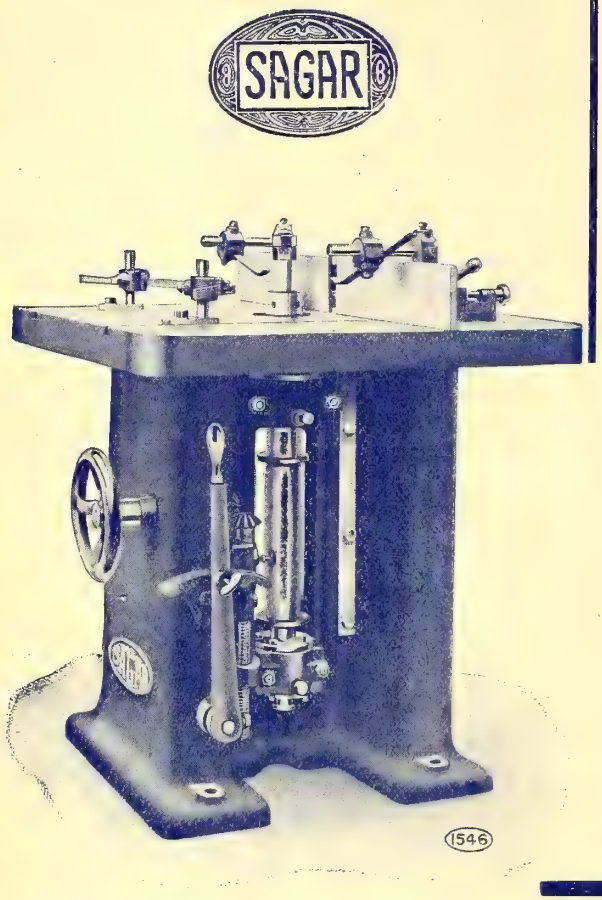

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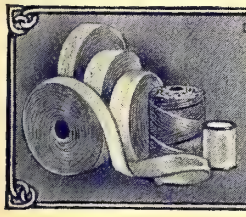

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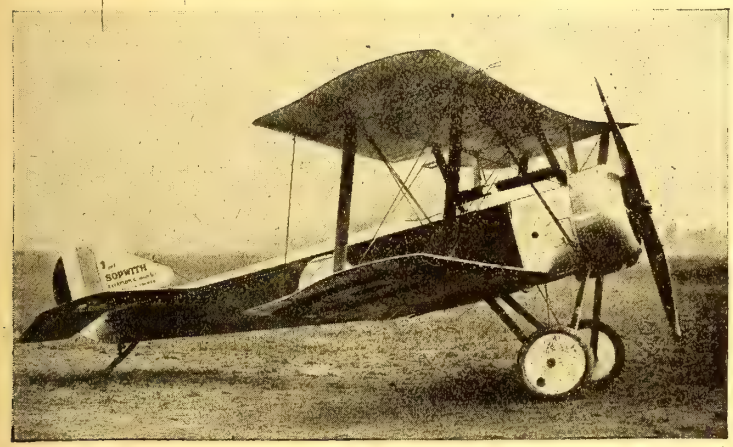

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ON THE NEEDS OF CIVIL AVIATION.—II.

The Air Conference's Mistake.

What is actually needed at the moment to make a success of Civil Aviation, or at any rate of such Civil Aviation as exists to-day, is two Frenchmen, two Englishmen, four motor-bicycles and a little common-sense.

While the Air Conference has been resoluting in favour of subsidies and orating on what aviation is going to do ten years hence it has entirely lost sight of what is needed at this actual immediate present moment. Foresight is an excellent thing, but it is no use having eyes like telescopes if they cannot read small print, and it is no use looking years ahead if one cannot see what is needed to-day.

No doubt the voluminous reports in the daily Press of the magnificent visions set forth at the Conference have done much to inspire the Man in the Street with faith in the future of aviation, whatever erroneous ideas he may have acquired as to its present state. But so far as one can judge nothing has been said or done to prove to the Man in the Office that Civil Aviation can help his business at this "directly minute" —as the children say.

Prove to the Man in the Office that he can get his letters delivered to or from Paris or Brussels or Amsterdam a few hours earlier by air mail than he does by train and boat, and he will use the air mail regularly, twopence or no twopence extra. But he is not going to spend his twopence for nothing. And so far, in the majority of cases, he gets nothing for his twopence, because he does not get quicker delivery by air mail—at any rate between England and France.

Where the Fault Lies.

It is no fault of the Air Transport lines. It is entirely the fault of the French and British Post Offices. A letter leaves London or Paris some time before midday of one day. It arrives in Paris or London at latest by 15.30 (3.30 p.m.) the same day. It ought to be delivered at latest by 17.30 (5.30 p.m.) in any of the business districts. And in the great majority of cases it is *not* so delivered.

The reason is simply that there is no proper system of communication between the Aerodromes and the General Post Offices either in London or Paris, and that the carrying of mails is confined to certain lines. The British Post Office will not send mails on French aeroplanes and the French Post Office will not send mails on British aeroplanes. Consequently mails have to go by certain machines when those machines go, and not, as ought to be the case, by the first machine which leaves after the mails reach the Aerodrome.

A batch of letters may arrive from the Post Office at the Aerodrome by road and be there for hours because the air line which holds the mail contract is held up for some reason or another, whereas if the mails were sent by the first machine ready to leave (contract line or not) they would arrive at the other end that much sooner.

And when the mails arrive at the Aerodrome by air they may lie there for hours because there is no motor cyclist to take them to the Post Office. One has oneself known a bag of mails from France to lie for two hours in the office of a firm at Croydon (without any official supervision) because there was no way of sending them to the General Post Office, so, of course, they could not be delivered during business hours.

The Simple Remedy.

The remedy is so simple as to be ludicrous. There should be two motor-cyclists continually plying between the General Post Office in London and Croydon, and two between the General Post Office in Paris and Le Bourgêt, between 07.00 in the morning and 19.00 (7 p.m.) in the evening, starting from the Aerodrome and from the Post Office respectively.

The one from the Post Office would deliver at the Aerodrome all letters for the air mail received up to the moment of his departure. These letters would leave by the first aeroplane ready to start.

The one from the Aerodrome would take to the Post Office all letters received by air. As there would be none at 07.00 in the morning he would merely arrive empty-handed on that journey and would return to the Aerodrome with any letters for the air mail which arrived after the other man left.

Meantime the man who started from the Post Office would bring back from the Aerodrome any letters which had arrived by air after the other man had left. If there were none he would return at once, empty handed. Obviously there would be few letters arriving by air before 11.00 in the morning, and none would be leaving after 14.00 in the afternoon in the winter, but there would be letters from the Post Office to the Aerodrome all the time.

Thus there would be a motor-cyclist to and from the Aetrodrome and the Post Office at least once every hour during the day, and probably once every half-hour during the busy hours between 10.00 and 16.00 hours in the Winter and between 08.00 and 20.00 hours in the Summer.

Thus no letter would ever wait more than half an hour either at the Post Office or at the Aerodrome without being sent a step farther on its journey. And so the Man in the Office would get his letters in London or Paris during business hours. *Which he does not do at present.*

Real Propaganda.

Convince the Man in the Office that the air mail is a real live force in Commerce, and he will soon learn to believe in air transport for goods and passengers. And then commercial aviation will develop of its own accord on its merits.

Real merit is the best of all forms of propaganda. One has done one's best personally, by tackling the Trade and Technical Press, to inspire belief in the air mail. One fears that one has unintentionally deceived a good many people in the course of this effort, for one was oneself deceived, by the Department of Civil Aviation and by the announcements of the Postmaster-General, into believing that air mails have been in the past what they would be if run on sensible lines such as those indicated hereinbefore.

It is for the Department of Civil Aviation to see to it that the present thoroughly bad system is altered at once. Let the air mails once run properly and there will be little need for expensive progapandist work such as the Air Conference. The money which has been spent on the Air Conference would have paid several times over for the four motor-cycles and the four motor-cyclists which are all that is really needed to make a solid success of Civil Aviation within a few months.

The Purpose of the Air Conference.

It must be confessed that one was mistaken as to the purposes of the Air Conference. Somehow one acquired the idea that it was to be a conference of men of importance in various trades and businesses to whom air transport would be of use if they knew it, and that the various notabilities who were to read papers at the Conference were to do so in order to convert these important people to a belief in air transport.

In the event it proved, as disclosed by Mr. Churchill at the inaugural lunch, that the Conference was an "Air Parliament," and that the underlying intention of those who organised it was to attract the attention of the Public (who do not matter two hoots to the progress of aviation) by way of the Daily Press (which has with unfailing consistency done more harm than good to the progress of aviation). One had hoped that men of the intelligence of Mr. Churchill and Sir Frederick Sykes would have realised by now that no help for aviation can be expected from the Daily Press and the General Public and that the only people worth considering are the Trade and Technical Press and the Business Community.

When one first looked round the Guildhall (which, by the way, is one of the most comfortable places in which one has ever slept) one was grieved to see that the audience at Sir Frederick Sykes' opening lecture was composed entirely of people concerned with aviation. It was in fact precisely the

audience to which one is accustomed on special occasions at the Royal Aeronautical Society. That is to say one could meet everybody who was there at either the R.Ae. Society, the Royal Aero Club, or the R.A.F. Club at one time or other.

When one had heard some of the discussion which followed Sir Frederick's lecture one was glad that other trades and businesses were not represented. And when some of the later discussions had taken place one felt that it was nothing less than a merciful dispensation of Providence which decreed that this should be only an Aviation Parliament and not a Conference of Men who Matter in the Empire's Industries.

Mr. Churchill's Candour.

At the inaugural lunch Mr. Churchill was as frank and straightforward as is his custom. He told us that this "Parliament" had been called now, when the Nation's Parliament was not sitting, so that the Press could deal with its debates while there was space to spare. In other words, aviation is a worthy "Silly Season" topic, along with big gooseberries, sea serpents, London's lions, and the scandals of Chinatown. He told us that the Government would support aviation, but said candidly that he could not pledge the Government to anything definite. And he repeated his eminently sensible dictum that "Civil Aviation must fly by itself."

Also he suggested that if the Conference chose to pass resolutions the said resolutions would be duly considered. But he was careful not to suggest the particular species of resolution which might have practical results.

Mr. Churchill is a firm believer in aviation and he is one of the very few great men in this country. Therefore one believes that he will do what he thinks best for aviation. But one does not believe that what he thinks best is anything like what many people think that he thinks. The key to his thought is the phrase "Aviation must fly by itself."

The Result of the Conference.

The result of the Conference is just what might have been expected, considering that it was an Air Parliament. The papers read were uniformly good. In fact, just the kind to which we have been accustomed for the last ten years at the Royal Aeronautical Society. And the discussions thereafter ranged in quality all the way from the best to the worst R.Ae.S. discussions of the last ten years.

One excludes from these remarks the proceedings on Thursday morning when the Chief of the Air Staff made a pronouncement of Imperial importance and Deputy-Chiefs of the Navy and Army set forth the views of the Senior Services on the Air Force. Those proceedings will be discussed by themselves in a future issue of this paper, as they are far too important to be mixed with the comparatively minor affairs of the Air Parliament.

So far as the Press was concerned, the result was a rash of silly headlines, exactly as might have been expected. Here are a few taken at random :—"Slump in Civil Aviation" (just when it is doing very well), "Flying Machine of the Future" (when the flying machine of the present is what matters), "State to Help Civil Flying" (a sure confession of weakness), "Hundred Passenger Plane" (which is years ahead), "Thames as Amphibian Harbour" (when Croydon and Cricklewood are much more important to-day; an ancient scheme discussed in this paper years before the war), "Steam Flying Machines" (a fallacy with which Captain Sayers deals faithfully in the Aeronautical Engineering Supplement this week), "The Government Promise Assistance" (when Heaven helps those who help themselves), "Will there be Manless Aeroplanes?" (when what we want is to show that aeroplanes are man's best conveyance), "Troops May Fly to Battle" (when what we want is letters to fly to the Continent), "Expert on the Future" (when the most useful thing would have been a mere practical man talking sanely on the present). And so forth and so on.

One is told that Lord Northcliffe had issued orders that aviation was to be given a "boost." Some of the ideas of his myrmidons in the "boosting" line are among the foregoing, Heaven defend aviation from boosting by Lord Northcliffe and his like.

Making Assurance Sure.

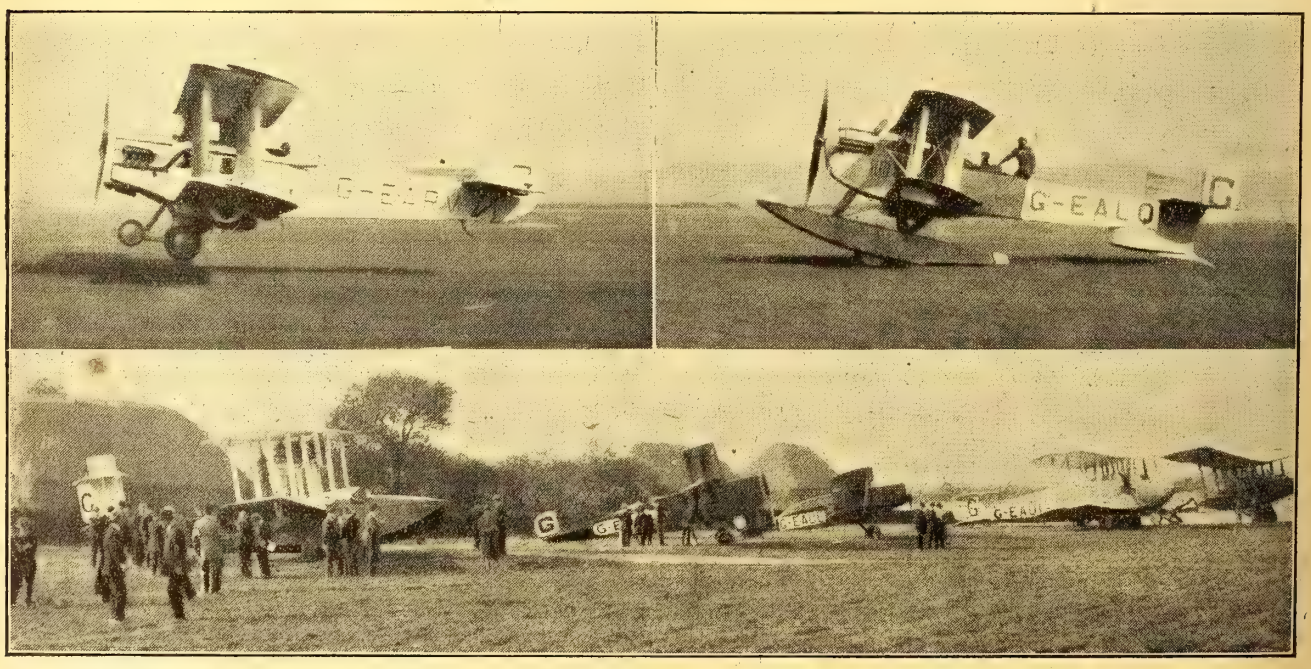
In fact the mere headlines alone were enough to scare off any of those elusive capitalist-birds who might have been thinking of settling on Civil Aviation. And to make quite sure that there shall be no mistake about it, the good solid conservative *Morning Post*, absolutely honest and quite devoid of imagination, published a sensible-sounding leading article on Oct. 14th, saying : "Mr. H. White Smith, Chairman of the Society of British Aircraft Constructors, stated that transport companies had worked from the beginning at a loss! 'the present cost was as a rule prohibitive.' It would seem, therefore, that neither the earning of a State subsidy for services rendered, nor the chance of making a commercial profit, provides that incentive to the investment of capital which inspired the development of the steam and motor industries."

Thus are we convicted out of our own mouthpiece, for Mr. White Smith spoke as the representative of the Aircraft Industry. Naturally the *Morning Post* could not take against Mr. White Smith's word the statements of Mr. Handley Page and Sir Sefton Brancker that air transport lines are in fact already paying commercial propositions. Nor could that excellent paper be expected to know that Mr. White Smith's figures were purely academic, based on costs of special types of machines under war conditions and that he spoke as a manufacturer of aeroplanes and not as an operator of air lines.

The net result of the whole "Parliament" seems to be that the Public (which does not matter) has received a wholly inaccurate idea of the present state and future possibilities of aviation, and the Capitalist (who does matter very much) has been very successfully choked off having anything to do with aviation, just when he was becoming amenable to reason

All for the Best.

One would be inclined to wish that all the clever people in



AT CROYDON : During the visit of the Air Ministry's Guests. The Westland Limousine getting off. The Fairey Amphibian taxi-ing in. Below, the Vickers "Viking III," the Avro Triplane, a Bristol Coupé, a Vickers "Vimy," the Austin "Kestrel" and a Handley Page 0/400.

the Air Ministry who organised this Conference had left Civil Aviation alone, but for the fact that one is convinced of the truth of the Buddhist faith that "all things work together for good." General Henderson once prophesied that the filthy English climate would give us the finest aeroplanes and pilots in the world, and his words proved to be true. Similarly one is convinced that all the silly mistakes made by the Air Ministry and the Post Office in the handling of Civil Aviation will ultimately result in our having the finest Air Lines in the world.

Nothing succeeds like success, and the more obstacles that are put in an Englishman's way the more he succeeds. One concludes therefore that the Air Conference was merely sent to try us, and that Civil Aviation will triumph over this setback in the end just as it has triumphed and will still have to triumph over so many others.

THE AIR PARLIAMENT IN BEING.

Sir Frederick Sykes' Paper.

That being that, one proposes to deal as briefly as may be with the actual proceedings in connection with this precious Air Parliament.

Setting aside the bouquet-throwing at the opening of the proceedings, the first thing that mattered was Sir Frederick Sykes's paper on Tuesday morning. Like all his previous pronouncements it was eminently sound and sensible, though he too seems to have fallen for the steam-engine fallacy. With that exception one can agree cordially with all he said. If he had had an audience of City business men or of the General Public it would have been very useful and educative. But his audience, being all aviation people, had heard it all before, and he was merely preaching to the converted.

He displayed a number of excellent tables of civilian flying, showing mileage, the small percentage of accidents, the work done by air mail lines, and so forth and so on. All these will be most valuable when he comes to preach to an unconverted audience. But readers of this paper know nearly all of them already.

Similarly readers of this paper know most of Sir Frederick's views on the factors contributory to successful air services, such as different types of machines for different jobs, improvement in ground organisation, signalling and so forth, wider meteorological knowledge, economic and financial factors, reliability of machines and engines, and all the other points on which he has spoken so wisely at various times.

He dealt very ably with what is being done to-day, but that of course did not appeal to the brainless reporters and their equally incapable editors as did his flights of fancy into the future. Really, Sir Frederick when he is talking for the Press in future will have to deny himself the pleasures of prophecy. Most of his prophecies of to-day will come true, just as most of his prophecies before the war came true during the war. But he would have more effect on the present if he would talk only about the present. The papers are bound to report him anyhow, and if he does not tell them anything about the future then they must perforce report what he tells them of the present. Which is what is wanted at the moment.

The Discussion.

Sir William Joynson-Hicks, M.P., who started the discussion, talked of the brilliant future without regard to practical politics as they are to-day. He wanted Civil and Military Aviation dissociated from the control of one Minister. He wanted individual subsidies for pilots. He did, however, make the sensible suggestion that the Postmaster-General should send all mails to the Continent by air. Which is the perfectly obvious way in which air transport may best be helped.

Sir Alan Anderson, a shipping magnate who has on previous occasions shown an interest in airships, dug up the old fallacy that commercial aeroplanes must be convertible into war aeroplanes—presumably to earn a subsidy. Also, he gave the comforting assurance that shipping firms would remain outside aviation till they saw that commercial aviation was going to pay—to which one may reply that when commercial aviation pays they will not be asked to come in. They will be very carefully frozen out by the people who are carrying by air the passengers the shipping firms would like to carry.

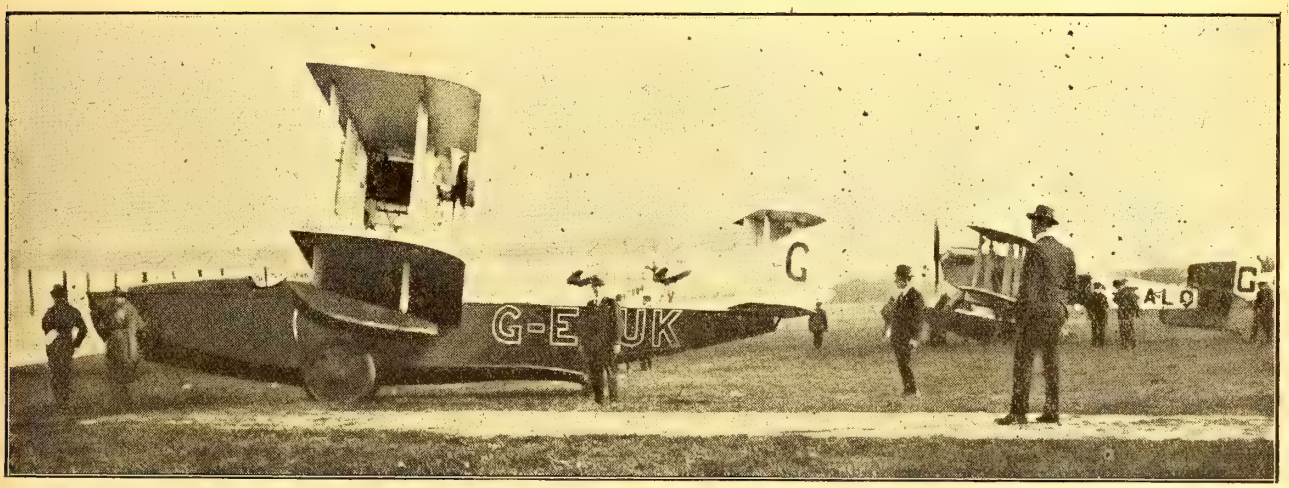
Mr. Holt Thomas, whom all were glad to see taking again an active part in aviation, said very sensibly that Civil Aviation did not want subsidies. It wanted payment for services rendered. Business-men were already paying double railway fares and a penny a word for telegrams. If the whole Continental mail were sent by air at an extra halfpenny per letter it would pay everybody concerned.—It certainly would. Letters average 35 to the pound weight. Which means 1s. 5½d. per lb. for carriage And any air transport company will carry goods to Paris or Brussels at 1s. per lb.

Mr. Instone, of the Instone Air Line, said that after 12 months' experience he found air transport a commercial failure. He pleaded for subsidies. And he made the amazing suggestion that the Government should build aeroplanes and hire them out to the air lines.—It is not surprising that the I.A.L. does not pay. Surely nobody would expect a taxi company to pay with all its taxis of different types and all its engines, tyre sizes, and so forth different. One has always imagined that the I.A.L. was experimenting with different types before deciding on which to standardise. As for using Government machines—would Mr. Instone care to operate a line of ships built in a Naval Dockyard and hired out to him by the Shipping Controller? One hopes that before long the Instone Air Line will be a commercial success on the good old commercial lines of buying the right thing and using it in the proper commercial way.

Mr. Bruce, of the Westland Co., said that present communications between aerodromes by wireless were too indirect. As regards the Industry, the Government had allowed the shrinkage to go too far. Ninety-five per cent. of the war-time Trade were now out of it. (One may add, "and a good riddance in the vast majority of cases.") Design staffs had been reduced from "nucleus crews" to "care and maintenance parties." He suggested that, instead of Competitions—which seemed rather like "severe corrections" when one read the official reports on them—the Air Ministry should provide work for designing staffs by selecting a dozen firms of proved competence and give them definite orders for definite types. (This is in fact a thoroughly sound suggestion, and one hopes to make it the text of an article at a future date.)

Mr. Lord, of the Avro Co., wished that General Sykes could instil into the Cabinet his own and his staff's enthusiasm for aviation.

Mr. J. T. C. Moore-Brabazon, who was not up to his best form, recommended that more attention be paid to meteorology. (A very sound suggestion on which one hopes to say much in the future.)



AT CROYDON.—The Napier-engined Prize-winners of the Air Ministry Competition. The Vickers "Viking III" and the Fairey Amphibian are in the foreground. The Handley Page "W.8" is behind the "Viking," and the Westland is seen dimly on the left. One is indebted to Mr. Jones, of the Napier Company, for the photograph.

Sir Charles Bright wanted to know why subsidies were bad for aeroplanes and good for cables. (This is rather hard to answer, except by the question, "Are they?")

Mr. Berriman said that present commercial air fleets are scratch fleets. None of them is capitalised at less than £1,000 per seat, none are run at less than £600 per seat per annum, none are working at less than £2 per seat per day. Even if all seats were full in all machines every day of 300 days per annum they could not pay. Subsidies should be granted on the basis of a guaranteed load. (All of which sounds very terrible, and is probably mostly true, but ought not to be.)

Sir Sefton Brancker said that he could see daylight ahead. If obsolete aircraft were replaced by proper commercial types the air lines would be paying propositions in a year. A Government guarantee of a mail contract would bring in the necessary capital. He doubted whether it was good to have Civil Aviation under the Minister of a fighting Service. Possibly it would be better under the Ministry of Transport, for it would be that Ministry's job to make it a success. (Altogether a very sound contribution to the debate, and worthy of General Brancker's old reputation for talking plain horse sense.)

Mr. Lawrence Wingfield suggested that aviation could be assisted by developing "Country Clubs" at civil aerodromes. (Possibly the time may come when a "Palais de Danse" may be a necessary concomitant of every aerodrome. Certainly after the serious practice of aviation much pleasure can be derived from the study of birds.)

Lord Montagu, the Chairman of the day, then allowed two other speakers to waste the time of the Conference for some time.

An Interlude.

After that we all drifted off to a very pleasant lunch provided by the Air Ministry; at any rate, one found it very pleasant, being singularly fortunate in one's neighbours.

Mr. Churchill was intensely amusing, as well as sound. One of his first phrases demands quotation: "If you will take into consideration the possibilities of any unpleasantness ever occurring in the world again, however remote, which takes the form of an overt act on one side or another—if we ever do that which we all pray may be averted by wise statesmanship—then military aviation is a vital element in the defensive organisations of this island." It deserves to go down to history with his "Europe Balkanised, such of it as is not Bolshevised."

Also he said: "To suppose that the world having got into the air is ever going to come out of it is as absurd as to suppose that the world having taken to steamships is going back to sailing ships. Certainly Mr. Churchill is most encouraging. If aviation had only to deal with statesmen of his calibre, instead of being compelled to fight and haggle with pettifogging politicians and obtuse, beef-brained business men, its success would be so easy that probably it would not succeed at all.

THE SECOND SESSION.

Mr. White Smith's Paper.

The afternoon of the first day was devoted to a paper by Mr. H. White Smith, of the Bristol Company, and, incidentally, Chairman of the S.B.A.C., on "The Operation of Civil Aircraft in Relation to the Constructor."

This paper was full of that sound reliable common sense which characterises all Mr. White Smith's utterances. His summing up of the causes which have militated against aerial transport are well worth recording. They are:—

1. That the public, though interested in flying, still regard people who travel by air as heroic and daring.
2. That business men are not yet satisfied of the certainty of aerial services.
3. That people are not prepared to pay the amount charged for passenger fares, and that the bulk of goods traffic cannot afford to pay air freight rates.
4. That those who have tried air transport object to being cramped up in a limited space and to travelling with only a small amount of luggage.

One cordially agrees with the first three statements, but from one's own limited experience of air travel one can state definitely that, in a Handley Page at any rate, the comfort is very much greater than that in any existing railway train. There is at least as much room to walk about as in a saloon coach, there is quite as much leg-room, and there is no jolting or jarring such as makes all railway travelling so tiring. The result is that at the end of a little over three hours one alights very much less tired than would have been the case after a railway journey of the same length. And as regards luggage, one was able, within the limits allowed, to carry a complete change of clothes and shoes, and evening kit.

Mr. White Smith very sensibly remarked on the prominence given to every aeroplane accident by the Press, and complimented the Department of Civil Aviation on the good work it had done in publishing facts concerning the infrequency of air accidents. He emphasised the need for all machines being fitted with wireless telephones and for directional wireless on the ground. One hopes to deal with this point at a later date.

He also pointed out the necessity for proper night flying arrangements if in the future air transport is to be developed to its uttermost.

Thereafter Mr. White Smith dealt with the question of costs. Unfortunately, this portion of his paper is very much too voluminous to be discussed here, for many of the figures would be of great interest to those professionally concerned with aviation. Mr. Handley Page later questioned the accuracy of some of Mr. White Smith's figures, so one hopes that space will be available to deal with this question also at a later date.

Continuing, Mr. White Smith dealt with the future demands of transport operators, the statements made being chiefly of a nature such as would interest the ordinary business man rather than the person already concerned with aviation. He also discussed aircraft engines and the possibilities of engines on different principles and using different fuel.

Discussing aircraft and engine maintenance in service, he made a number of excellent points, taking the motor 'bus as an example of regular running on public service. To Mr. White Smith belongs the credit of being the first person to suggest publicly that an aeroplane should be so built that the entire engine unit can be removed from the machine and another engine installed, so that the aeroplane may not be kept idle while the engine is being repaired.

In discussing opportunities in foreign countries, Mr White Smith stated that fog is not met with to any extent in other parts of the world. On this point one would like to draw his attention to the fact that about a fortnight or three weeks ago a paragraph appeared in the daily papers stating that all the great Atlantic liners then in New York Harbour, or trying to enter New York Harbour, were held up for two or three days by a persistent fog.

Altogether it was a thoroughly excellent paper, and if the parts intended purely for the consumption of the general public were removed, the rest would provide matter for an excellent debate at the Royal Aeronautical Society.

The Discussion.

Lord Weir, lately Air Minister, opened the discussion, talking his usual sound engineering sense combined with humour in his own inimitable manner, which is an excellent blend of a "Wee Free" Meenister and Sir Harry Lauder. He premissed that the civil community and the Government were both vaguely conscious of the importance to them of aviation. He said that no Government action could compel prosperity, but that the Government could best help by using the air services. It was impossible to over-rate the value of the cross-Channel services. Unfortunately, no capital was available to-day to help it develop.

Speaking as an experienced engineer, he said that technical development without commercial co-operation was useless. Possibly there were more profitable spheres for aviation in the British Dominions, but the air services between European capitals were the best possible advertisement. The Government must regard the air services as so important as to warrant support, and, he added, we had many assets (somebody whispered "Did he say 'Asses'?") in commercial aviation.

Mr. Handley Page said that after the morning's discussion and some of Mr. White Smith's remarks he felt as if he had come to bury civil aviation, not to praise it. Speaking from experience, he said that aerial transport was very comfortable. There was no vibration, one arrived fresh and clean, having experienced the exhilaration of mountain air, and one travelled with a high degree of comfort, besides saving very much time.

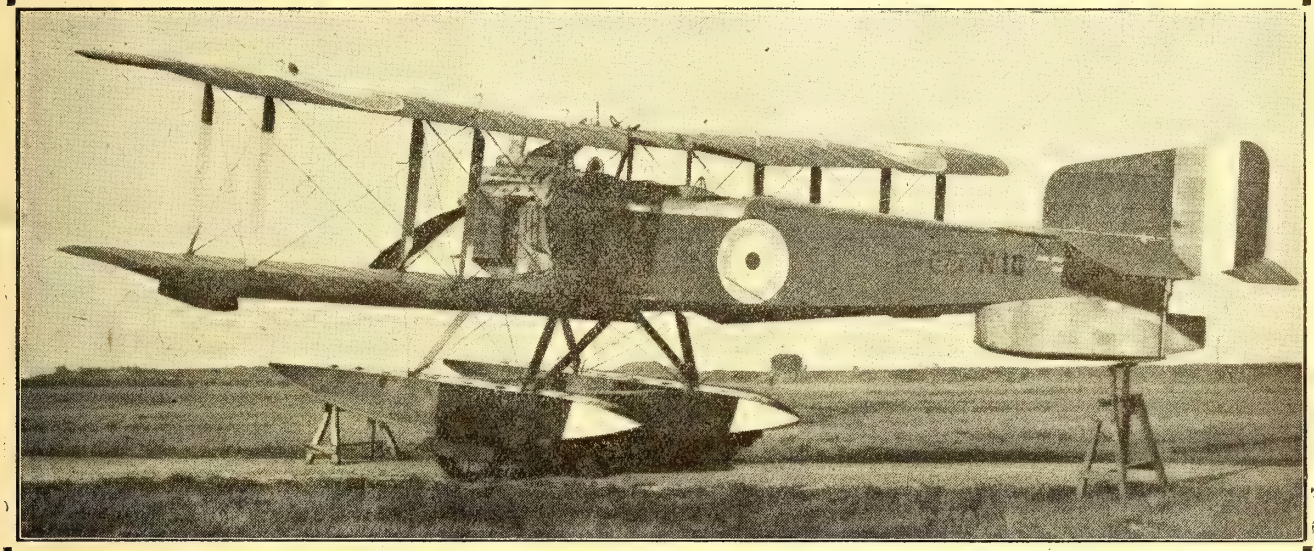
He mentioned that the Managing Director of Nasmyth, Wilson and Company had chartered a special aeroplane to go to Bukharest. His flying time was 18 hours, whereas it took four or five days by train. While at Bukharest he wanted to go to Jassy, which is 20 hours by train, with luck. He flew there and back in a day.

The way to minimise breakdowns was to work engines less and fly at cruising speed. He admitted that the machines of to-day are like the ships of the Spanish Armada so far as development is concerned. He believed in passenger traffic as against mail traffic because it was easier to persuade 180 lb. of passenger to travel by air than to persuade 6,000 people each to send a half-ounce letter. Mails ought to be sent by air compulsorily.

He stated that Mr. White Smith's operating figures were very much too high. Instead of being £22 9s. per flying hour for a Handley Page of the O/400 type, or £11 8s. per passenger to Paris at a 75 per cent. load, the cost was between £16 and £17 per hour, which reduced the figure to 6d. per passenger mile.

(*Continued on page* 685.)

A MAKER OF HISTORY.



The Fairey Amphibian, which performed so well in the Air Ministry Competition, was designed in 1916 as an ordinary Seaplane, was known officially as the N.10, and was the first of the Fairey "Series III." She is here seen in her original form.

THE HISTORY OF A SEAPLANE.

She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness; She has survived Nine Different Engines.

In all this work no Single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Unit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

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AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

Certain statements made by Air Vice-Marshal Ellington, Director-General of Supply and Research, Air Ministry, in a paper read before the Air Conference on Oct. 13th, are criticised in an article below.

The paper itself and the discussion thereon are reported in abstract immediately after the said article. Apart from the points specifically dealt with in the article, items of interest in the paper are the statements as to the development of the "Swashplate" type of engine, a description of one particular variant of the Handley Page wing which is not of a very enlightening nature, and the announcement as to the policy of the R.A.F. in regard to fitting parachutes whenever possible to single and two seater machines.

The paper by Capt. Barnwell, read on the afternoon of the same day, will be reported and commented upon in the next issue of this journal.

A very interesting consideration of the proper rates for depreciation charges on war-type aircraft used for commercial services, issued by the Canadian Air Board, is published on page 678.

TECHNICAL MATTERS AT THE AIR CONFERENCE, 1920.

The papers read and discussed on Wednesday, Oct. 13th, when Lord Weir occupied the Chair, were of a specifically technical nature and of a very distinct interest. Of those papers that read by Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., Director-General of Supply and Research at the Air Ministry, on "The Present Position of Aircraft Research and Contemplated Developments," owes its importance very largely to the fact that it represents in the main the attitude of the official department concerned towards undoubtedly one of the most important of the branches of aeronautical activity.

It will be fairly evident from the abstract of the paper which follows hereafter that the Director-General of Supply and Research is adequately and even keenly alive to the importance of continuous efforts towards improved technical development, and that research work is being officially directed upon sound lines.

Nevertheless, it must be added that, particularly in view of the particular occasion of the paper, and the amount of attention which has been given to the Air Conference in the daily Press, Air Vice-Marshal Ellington has been guilty of affording a number of opportunities for the dissemination amongst the ignorant of entirely misleading information of precisely the type which appeals to the ordinary editorial mind as possessed of "news value."

The Steam Turbine Scare.

Two particular items of the paper may be instanced in this regard. No reader of the daily news-sheets will have failed to notice the way in which the lecturer's references to the steam turbine have been taken up by them.

What Air Vice-Marshal Ellington actually said regarding the steam turbine was that an engine for aircraft of this type was being developed experimentally, that the main difficulties to be encountered were those connected with the design and construction of suitable condensing plant. In the light of recent knowledge it might be possible to produce steam plant which would combine the qualities required of an aero engine except possibly that of a low weight per h.p. Among the qualities which were definitely claimed as possible was that of low fuel consumption and of safety from fire.

Taking this statement it affords to the uninformed an adequate excuse for assuming that there is a distinct possibility of the steam turbine displacing the internal combustion engine in the near future, and of its adding distinctly to the economy and safety of aircraft operation.

Some Facts.

What are the facts as to the present state of the steam turbine? Taking it under its best operating conditions—that of a modern power station—the most economical speed of rotation for the multiple stage type of turbine running on high pressure superheated steam and a high degree of vacuum is too great for the direct driving of electrical generators in most cases. The actual speeds of rotation achieved in practice are practically never below 1,500 r.p.m. in units of 5,000 h.p. and upwards, and speeds as low as this are achieved only at the cost of some sacrifice in the fuel economy of the turbine.

Thus, taking the multiple stage type of turbine, efficient turbine speeds are too high for efficient airscrews for large power units. Turbine units of much less than 1,000 h.p. are in practice less economical than reciprocating engines, because the turbine in small sizes calls for still higher speeds for efficient operation, and, therefore, in small units efficiency must be sacrificed either by the introduction of gear losses or by building inherently inefficient turbines.

A Complicated Problem.

All such turbines as have been produced for stationary purposes are naturally far too heavy for aircraft work. The weight per h.p. of the turbine itself could possibly be reduced to within the limits acceptable for airship or aeroplane propulsion, and the most feasible method at present visible seems to be the use of turbines of the single stage type such as the De Laval. But reasonable efficiency in such a type calls for even higher rates of revolution than those of the multiple stage type, and reduction gearing becomes absolutely essential for any purpose. Generally speaking, the reduction gears of the De Laval type of turbine weigh considerably more than does the turbine itself, and occupy a greater space. It seems very difficult to believe that a total weight of turbine and any conceivable gear to drive an airscrew at a possible speed can be brought down to 2 lb. per h.p. There is then to be considered the weight of steam-raising and condensing plant. Steam-raising plant is obviously necessary, and using liquid fuel and flash-type boilers its weight can undoubtedly be brought to very much below that of any existing stationary boiler plants. Even so it must possess an appreciable weight.

The necessity of condensing plant is not so immediately obvious, but, if it is remembered that a consumption of water of 8 lb. per h.p. hour is below the best regularly attained in stationary power plants, and that unless condensing plant is fitted the aeroplane must carry 8 lb. of water per h.p. per hour of flight its importance becomes apparent. Not only must it be present, but it must be effective in returning to the boiler, in the form of water, a very high percentage of the total steam exhausted by the turbine, for 12½ per cent. loss of water per hour by leakage and evaporation means at least 1 lb. per h.p. per hour of flight of water to be carried as "make up" feed for the boiler. The necessary condensers are scarcely likely to be negligible, either in weight or in resistance.

And to attain an economy in steam consumption—and consequently in fuel—of anything like the figure above assumed, it has hitherto been found necessary to install air pumps to secure a high degree of vacuum on the exhaust end of the turbine. Such air pumps are generally of a weight which can by no means be neglected. Air Vice-Marshal Ellington's admission that there are doubts as to whether a low weight per h.p. can be attained are therefore more than justified.

There is no doubt whatever that for very short flights where the weight of fuel consumed and of water lost are unimportant, a steam turbine is a possible aerial prime mover, for then a light but inefficient turbine and boiler unit can be used and condensing plant may be of a sketchy nature.

But for longer flights, where weight of fuel is important, all the accessories mentioned are essential to fuel economy, with existing types of turbine, and even then the fuel consumption of the best steam plant known is just double that of a good aeroplane engine—or roughly 1 lb. of fuel per h.p. hour instead of ½ lb. in the petrol engine.

The Effect of High Fuel Consumption.

Now the highest figure for useful load carried reached in the recent Air Ministry Tests for Aeroplanes was 3.42 lb. per h.p. And a plant using twice the weight of fuel would have The weight of fuel carried appears to have been 2.31 lb. per h.p. Now a plant using twice the weight of fuel would have reduced the useful load capacity of this machine on this flight by 2.31 lb. per h.p., or to 1.12 instead of 3.42.

It is therefore obvious that a practically useful steam turbine plant for aeroplanes—or airships—must necessarily involve a revolutionary change from the present type of steam plant. It must be of enormously improved economy, of greatly reduced bulk, and of but a tithe of the weight of any known example of commercial steam turbine plant.

And, if methods of attaining these ends concurrently are in sight, it seems fairly obvious that the great lighting and power stations of the world offer a more renumerative and a less circumscribed field for the exploitation of so important a development than do aircraft.

When the power stations of, say, the Underground Electric Railways of London can operate their turbines at half their present consumption of coal per b.h.p. hour, it may be time to reconsider the steam turbine as an aero-motor.

The Helicopter.

Equally misleading—and equally of appeal to the average journalistic mind—was the reference to the helicopter. The helicopter has received considerably less attention than it deserves, and there is a very large field open for experimental work in the solution of the practical problems that it involves. The dictum of the Director-General of Supply and Research that the helicopter "falls like a stone" when the engine stops is precisely the type of statement that is seized upon as authoritative by the uninformed, and is by no means calculated to aid those who are minded to experiment in such a direction in securing public sympathy.

It is as absolutely untrue that the helicopter necessarily "falls like a stone" as is the similar statement regarding an aeroplane, but the belief that the statement is true in the case of the aeroplane is still widely held and is still an effective obstacle to public confidence in aircraft.

These two items of the paper have been dealt with at considerable length, not because there can be any possible objection to Air Vice-Marshal Ellington personally holding his own particular views on the subject of the steam turbine, or of the helicopter, but because it is of vital importance in the present stage of the development of aeronautics that holders of official positions which give to their public utterances an appearance of authority should restrain these utterances to afford the least possible excuse for the propagation amongst the ignorant of extravagant hopes or of unfounded fears.

W. H. S.

THE PRESENT POSITION OF AIRCRAFT RESEARCH AND CONTEMPLATED DEVELOPMENTS.

By Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., Director-General of Supply and Research.

The following is a very brief synopsis of Air Vice-Marshal Ellington's paper :—

During the war the impetus was entirely military, the all-important factor in research being speed of progress in the development of fighting machines. There was no time to devote to lines of research which did not promise practical results almost immediately in view of the prospective end of the war, with the result that aircraft and engines produced during the war were almost entirely developments of pre-war types. The progress made in armament, navigational instruments and other accessories, with little or no pre-war experience available, was more fundamental.

Such an opportunist policy as the war demanded is, however, quite unsuitable for times of peace. It is no longer a sound policy to sacrifice everything to immediate results and accept the risks involved in decisions based upon insufficient technical data; the principles of scientific research must once more be rigidly applied, and progress only sought along a line of advancement upon which each successive stage is thoroughly explored and understood before the next is attempted.

Present Position and Contemplated Developments.

The main developments now in progress or under contemplation for military and civil aircraft were dealt with under the following heads :—

(*a*) Aeroplanes and seaplanes, and engines.
(*b*) Airships and kite balloons.
(*c*) Navigational instruments and apparatus.
(*d*) Accessory developments to increase the comfort, safety, and efficiency of the passengers and crew.

(*a*) Aeroplanes and Seaplanes and Engines.

The main requirements for aeroplanes and seaplanes were stated broadly :—

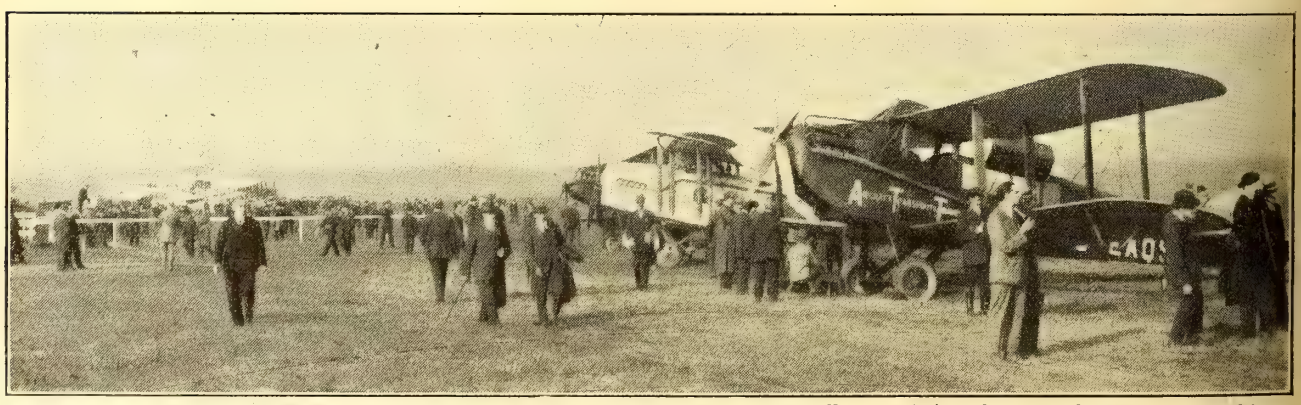
(i) Reliability; (ii) Controllability; (iii) Capacity to take off or land in a restricted area; (iv) Performance; (v) Safety and comfort; (vi) Cheapness.

(i) *Reliability.*—Reliability is largely a question of engine, and more particularly engine accessories, such as magnetos, and petrol, oil and water cooling systems. The new types of engines now being considered were considered under this heading. Apart from normal developments of existing types, these include the steam turbine, the "swash-plate" engine, wherein the crankshaft is replaced by an inclined disc, and the cylinders are parallel to the shaft, and the possible application of the Diesel principle to aircraft engines.

(ii) *Controllability.*—This question was reviewed with particular attention to the control of big engined machines, and the problems affecting those with a central engine room.

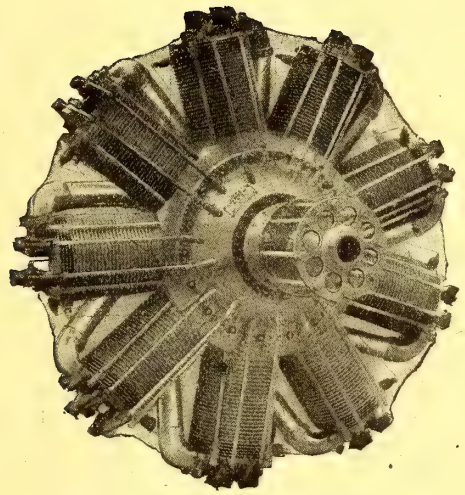
(iii) *Capacity to take off or land in a restricted area.*—This is of the greatest importance in both civil and military machines. The problem is mainly one of wing and propeller design, and particularly the development of a satisfactory variable camber wing. The Fairey variable camber device and the Handley Page wing were referred to in particular, and the latter described as a wing fitted with a false leading edge carried ahead of the true edge with an air space intervening. Reference is also made to the question of landing aircraft on ships.

(iv) *Performance.*—In military machines, the need for performance is paramount, and while it is also important for civil machines, considerations of reliability, comfort, etc., must re-



THE AIR CONFERENCE.—Participators in the Conference at the Croydon Terminal Aerodrome. Commercial machines lined up for inspection. The two nearest machines are a D.H.18 of A. T. and T. Ltd., and a Westland of the Air Post of Banks.

GWYNNES' AERO ENGINES



B.R.2 MODEL. 250 H.P.

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ceive greater weight. The development of engines from the point of view of lightness was discussed

(v) *Safety and comfort.*—The steps which are being taken to promote safety and comfort of passengers and crew were dealt with later in the paper .

(vi) *Cheapness.*—The importance of cheapness in construction and maintenance is self-evident for civil aircraft, and it is also of the greatest importance for war purposes in that cost is a reflection of time and labour expended. Efforts are being made to produce more durable machines by introducing a wider use of metal construction. Metal propellers are also being developed, and cheaper forms of fuel are being investigated.

(*b*) Airships and Kite Balloons.

(i) *Airships.*—The construction of rigid airships in this country is entirely a war development. The first ships built followed closely the established German practice, but there are now under construction two ships embodying new principles of hull construction which have been developed in this country—the R.80 and R.38.

An insight into the most recent German practice has been afforded by the surrender of the L.71 and L.64, the most noticeable features of which are the construction of the gas bags, and the arrangement and reliability of the machinery. In both these directions special research is being undertaken.

Considerable success has attended the efforts made to develop a method of anchoring airships in the open by means of mooring masts, thereby obviating the necessity of sheds except for extensive repairs.

The possibility of carrying aeroplanes on airships is also being investigated. Research is being carried out on a variable pitch propeller for airships, and also on methods of recovering the water from the exhaust gases of the engine, which, if lost, means a reduction of weight of ballast, thus necessitating a discharge of gas.

(ii) *Kite Balloons.*—Though it is not anticipated that kite balloons will be used again for observation as they were in the recent war, captive balloons have a value for meteorological and other special purposes which are being investigated.

(*c*) Navigational Instruments and Apparatus.

The development of compasses, turn indicators, and other instruments, were discussed, including directional wireless and navigation by astronomical observations.

The principal difficulty in navigation at the present time is landing in fog, and the hope was expressed that a solution may be found to the problem of fog dispersal. In the meantime, efforts are being made to mitigate the difficulty by means of landing flares and electric lighting devices similar to those now employed for landing by night As fogs are normally confined to a few hundred feet from the ground, devices for landing a machine automatically from a known height are being explored. Two methods for finding the true height of an aeroplane from the ground (or sea in the case of seaplanes) are being investigated; one by means of sound, and the other by the use of wireless telegraphy.

(*d*) Comfort, Safety and Efficiency of Passengers and Crew.

The most important lines of development under this head are those directed to the prevention of fire and the use of parachutes.

In order to minimise the risk of fire, the separation of the passengers and crew from the engine and petrol tanks by means of bulkheads is being considered, as also are devices for releasing petrol tanks in case of fire. For military machines, improvements in self-sealing tanks to withstand incendiary bullets, and also tanks which offer the least chance of catching fire in a crash, are being investigated.

The provision of parachutes is a controversial question. Against the obvious advantages are to be set the fact that it is only when a machine has got out of control that the call for a parachute descent would arise, and in these circumstances the question of getting clear would be a very difficult one. In all machines, and particularly military ones, the extra weight is a consideration. There is no doubt, however, that the provision of parachutes may be the cause of some lives being saved, and for that reason they are now being fitted in all R.A.F. machines of the small types where possible. [It should be noted that this is the first official statement that parachutes are to become a standard part of the equipment of the R.A.F.—Ed.] Two types of parachutes are being developed: one in which the occupant jumps from the machine, and the other in which the parachute is blow open as the machine descends, thus lifting the occupant clear.

An important source of accidents is that due to starting engines by propeller swinging. To meet this, mechanical starters are in existence, but a successful starting apparatus which forms an integral part of the machine and its engine has not yet been tried out.

From the point of view of comfort, mention was made of oxygen apparatus, electrically heated clothing, and other improvements of a less important nature.

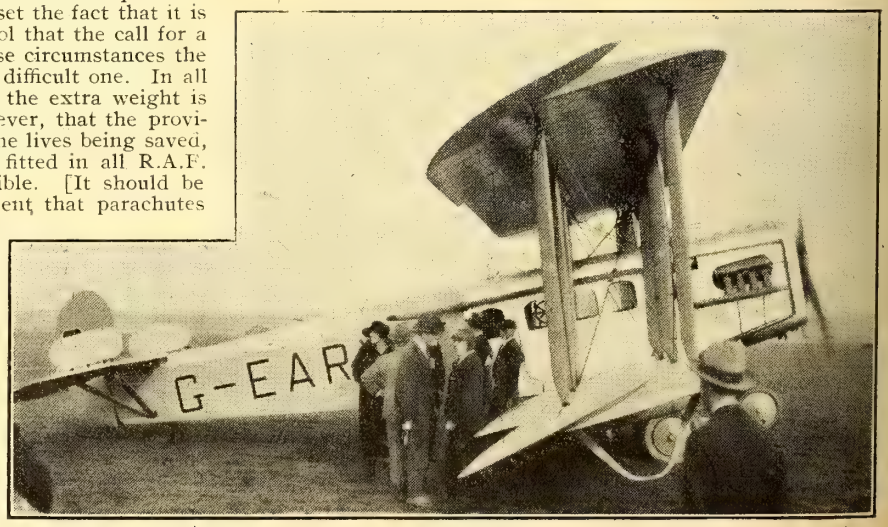
The Discussion.

After the Chairman had complimented Air Vice-Marshal Ellington on his paper and had pointed out that the exigencies of time made it necessary to restrict speakers in the discussion to ten minutes each, he called upon Sir Richard Glazebrook—late of the N.P.L.; now Zaharoff Professor of Aeronautics—to open the discussion.

Whereupon Sir Richard proceeded for the space of some thirty-five minutes to bore the assembled company with a long account of how keenly alive he, the Aeronautical Research Committee, the N.P.L., and various other bodies and persons, were to the importance of researches of the type dealt with in the paper and to the necessity of training competent persons to carry on such researches in the future. In no sense did he contribute to the elucidation of the problems which now confront the art of aviation, and he very effectively prevented several others who could have done so from speaking at all. It is high time that a strict training in humility were made a compulsory part in the education of all scientists. Fortunately, the ribald remark of one auditor that "Men may come and men may go, but Glazebrook goes on for ever," was not strictly accurate, and he eventually gave place to Mr. F. M. Green.

Mr. Green joined issue with Air Marshal Ellington on one or two points. In the matter of the cantilever type wing he objected that there was no actual reduction in the amount of vulnerable bracing—it was merely put where it was invisible. The cantilever wing might have other advantages—he thought it had—but not this one. One of the vital features of the development of aircraft was the maintenance of a high standard of detail design. Bad detail design would mar a machine based on the soundest aerodynamical principles, but good detail work could pull a basically inferior design through to success. The war had produced numbers of capable draughtsmen with experience in detail work, and loss of their services would be a severe handicap to the aircraft industry. The only way of retaining the services of those who remained was for the Air Ministry to give designing firms experimental machines to design and build.

Mr. Chorlton, of the engine department of Beardmores, Ltd., said that engine designers were now placed in a difficult position by the lack of precision in the statements made by different authorities as to the requirements for commercial aero engines. These were roughly two schools. One called for reliable engines—heavily built and of low fuel consumption. The other school said that heavy engines could not be tolerated as they reduced the available cargo capacity to below the paying limit. It was gathered that what he asked for was a statement from aeroplane builders as to exactly what extra weight per h.p. they were prepared to tolerate as the price of improved reliability. He pointed out that heavy engines could not possibly make up for their own weight by their improved fuel economy except on long distance journeys, and that airships therefore gave more scope for heavy



THE AIR CONFERENCE.—The Westland machine with Napier engine which won the first prize for small machines in the Air Ministry Competitions, was a centre of attraction to all visitors during the visit of the Conferenciers to Croydon, and made a number of flights with passengers.

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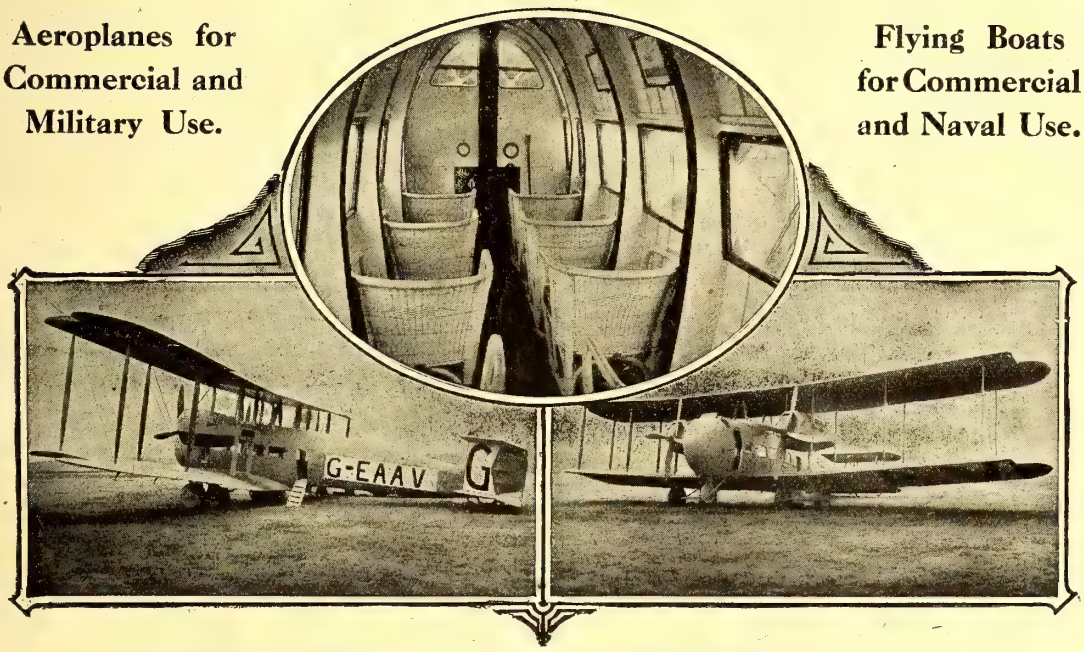

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types—particularly the so-called Diesel. Incidentally, he objected to the term Diesel; the engine usually known as the Diesel type operated on an English cycle—the Stuart Akroyd—and there was no need to use a German label for it. [Which is as perfectly true as that aniline dyes were a British invention, and that in both that case and the one now in question it required German pertinacity and business sagacity to turn the invention to profitable commercial uses.—Ed.]

On the subject of the steam turbine he asked for more light. Steam had many valuable features as an aircraft prime mover, but as the best thermal efficiency attainable in the relatively small turbine units necessary for aeroplanes was about 15 per cent., as against the 30 per cent. of the internal combustion engine, he failed to understand how Marshal Ellington hoped to achieve reasonable fuel consumption. As to the limiting size of aero engines he did not believe in the limit of 100 h.p. per cylinder.

If aeroplanes called for 5,000 h.p. engines in the next few years, he thought they could be built as quickly as the aeroplanes were built to take them. As regards supercharging and forced induction there was another use than that of maintaining power at altitudes. The method could be used to give an engine a 25 per cent. excess over normal power for getting off or surmounting obstacles, and afterwards substituting an inert gas for part of the air, for keeping a high compression and consequently a low fuel consumption during normal flight.

Mr. Calthrop, of the "Guardian Angel" parachute, then discussed the parachute problem. Unfortunately, owing to large numbers of the audience leaving the chamber, his remarks were practically inaudible.

AIRCRAFT DEPRECIATION AND COSTS.

The following document, at once instructive and amusing, has been issued by the Air Board of Canada as Bulletin No. 1:—

It is a well-known fact that auditors now accept as an axiom that in commercial life as many firms fail through not knowing their cost price as from any other single cause. If this is true of ordinary every-day business life it is going to be very greatly accentuated in commercial aviation. At the present moment it is probably safe to say that of the various firms engaged in the operation of aircraft commercially, not one knows with any degree of certainty their cost. This item, as everyone is aware, is made up of various factors which might be tabulated as cost of operation, interest on investment, and depreciation. It is a comparatively simple matter to arrive at an exact total for the first two, but the third is always difficult to determine.

Experience in operating of aircraft on anything like a large scale dates entirely from the outbreak of war. So very little was done in aviation prior to 1914 that the knowledge gained of aircraft as a commercial proposition was negligible. War experience is, unfortunately, of such a nature as to be of little use when considering the operating of aircraft from a commercial point of view. The result is that to-day all aviation companies are more or less in the dark and merely waiting the results of their first year's operations to determine with some degree of certainty the various figures which will go to show them whether or not they have made a loss or a profit. A typical state of affairs might be mentioned when the writer called upon the managing director of one of England's greatest aircraft concerns for the express purpose of finding out how this company estimated depreciation. The statement given was, "We have very little idea what our depreciation is, but we are accepting as an arbitrary figure 100 per cent. per annum per machine."

Further inquiry amongst the various commercial concerns in England elucidated the fact that each one was as much in the dark as the one quoted. The inference is obvious. These very large concerns are operating, hoping they are making a profit, but totally unable to say definitely that they are.

The airy way in which the average pilot dismisses the question of costs from his mind may have been well enough during the war when all efforts had to be concentrated upon winning the war irrespective of whether it was won at a price of £8,000,000 per day or £80,000,000, but this state of affairs, of course, cannot continue and business men demand figures, not theories. A close study of the question, combined with details gleaned from records kept during four years of aerial warfare, such information as has been gained by conversations with those interested in commercial aviation in England, and the study of figures compiled in the States, has resulted in the following estimate of that major portion of the cost of aerial operations, depreciation.

For purposes of reducing depreciation to a percentage basis this factor has been divided into two portions, A and B.

A.—Constant Depreciation.
B.—Depreciation due to flight.
(i) Crash risk.
(ii) Deterioration.

I will now endeavour to explain these items.

A.—Constant.

Every one who has been connected with aircraft knows that if an aeroplane or seaplane is placed in a hangar and left there for a period of years, despite reasonable care being taken of it, at the end of a certain period of time the machine will have lost a great portion of its former value. In the first place the fabric will have become soggy and certain parts of the woodwork will in all probability have warped. This depreciation would in time entail a very thorough complete overhauling. A still more serious factor that has to be considered, however, is the fact that in a period of years, due to obsolescence the machine will have lost practically all of its former value. It is reasonably safe to say that the machine of to-day will not be flown in general use four years hence. Type and kind is constantly in a state of evolution and of this fact one must not lose sight. This is particularly true at the present time when practically all machines on the market have been built for war purposes with the lowest possible factor of safety and the greatest possible speed and climb.

One might instance the case of the various types of training machines on which many of the readers of this article learned to fly. It is almost ludicrous to cast one's mind back to even such a recent date as 1915 and think of the Maurice Farman Long Horns and Short Horns, the Grahame-White Henriqs and the Henri Farmans, on which we used to make our earliest efforts. These machines have long ago become obsolete for all purposes and if any survive to-day their market value is practically nil owing to this factor of obsolescence. It is difficult to estimate this constant depreciation accurately, but if one accepts a maximum of three years as being the usual period of time during which a war type of machine may be expected to serve a useful purpose, then we get a figure of approximately 3 per cent. per month constant depreciation.

It is emphasised that this estimate must be taken into account whether the machine is flown or not.

B.—Deterioration due to flight.
(i) *Crash risk.*
(ii) *Deterioration.*

(i) *Crash risk.*—Everyone who has had any experience of flying knows of the large crash risk that was incurred during the war in the operating of aircraft. One had only to stand on a busy aerodrome any day when machines were constantly landing or taking off, to see how large this factor is in the percentage of costs. No matter how skilful the pilot accidents will happen even in peace and the resulting expense involved in repairing the aircraft will be considerable.

Difficulty is again experienced in estimating the usual amount of time a machine can in peace be flown without being crashed. Practically all we have to guide us is the war experience of war pilots. In this connection one can recall the very considerable publicity given to a young gentleman in the R.F.C. who was heralded by the Illustrated Daily Press as the "Crasher King," having survived no fewer than seventy-eight crashes. History does not relate why he was permitted to continue on his career of vandalism.

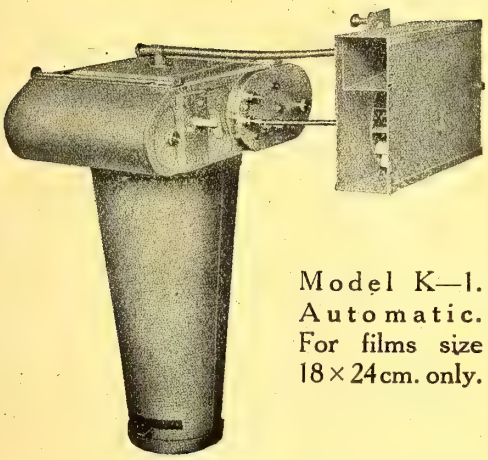
One also can recall a very senior officer of the R.N.A.S., whose enthusiasm for flying very greatly over-balanced his skill as a pilot, and whose write-offs in the aggregate must have amounted to a prince's ransom. Needless to say, there is no place in civil life for this type of pilot, and, happily, at least one pilot is known to the writer who has completed 1,000 hours flying in France without a single write-off against him.

Investigation of the subject seems to indicate that among high-class pilots one must look for a complete write-off in aeroplanes every six hundred hours and in seaplanes every five hundred hours. This record will probably improve very considerably as war-time machines give place to commercial types, but until the war products are used up it is not considered safe that one should figure any less than one-sixth of one per cent. per flying hour crashes against aeroplanes and one-fifth of one per cent. per flying hour against seaplanes.

It may be explained that the loss in seaplanes is usually greater than in aeroplanes, as slight accidents often result in the seaplane sinking, thus converting a partial into a total loss.

(ii) *Deterioration.*—The last factor to be considered is deterioration. Every type of aircraft has a flying life, that is to say, after a machine is erected and flown a time will come when, apart from crashes, it will become unfit for further service. This life must, of course, differ in different types of machines, the life of some being greater as the factor of safety of the machine is higher and landing speed lower, etc. For other types of machines the life will be shorter. One type of machine may be instanced which probably has the worst flying record of all, the flying-boat. In one of the largest seaplane stations in England it has been found from

Aerial Photography



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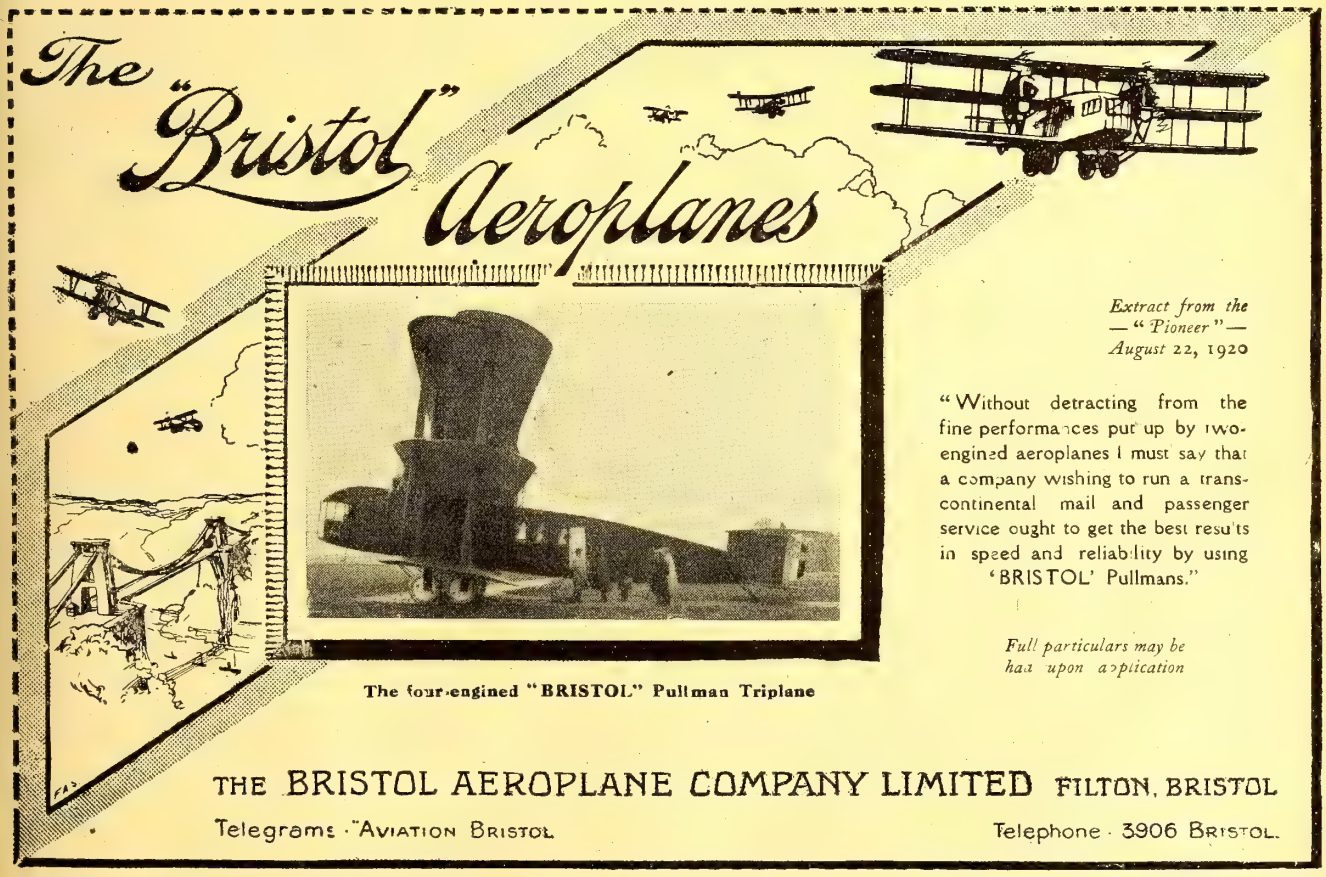

careful records of figures kept during the war that the life of the hull of large flying-boats was just over seventy hours. This figure excluded all war risk and simply took care of wear and tear. In another squadron of the same type of machine the average was 103. On the other hand, we find examples of aeroplanes whose life averaged between 700 and 800 hours, and in one or two instances the known life of an aeroplane has even been as great as 1,000 hours with only very minor repairs. A careful study of all figures available seems to indicate that the average flying life of an aeroplane may be stated to be 700 hours and of a seaplane 400 hours; or, in other words, that the allowance for deterioration should be at the rate of one-seventh of one per cent. per flying hour for aeroplanes and one-quarter of one per cent. per flying hour for seaplanes.

It now becomes apparent that A and B must be considered separately. In the event of an aeroplane being bought and not flown the only factor that need be considered is constant depreciation, since the machine is not subject to either crash risk or deterioration due to wear and tear. In the event of a machine being used during the summer months only and stored during the winter months, it will be necessary to charge depreciation under different headings. In other words, during the winter months when machine is stored depreciation should be charged as shown in A.

A.—Constant depreciation—3 per cent. per month.

The two remaining factors to be considered are B (i) Crash risk and B (ii) Deterioration.

B (i)—Crash risk. It is obvious that since under B (ii) the aeroplane is to be written off in 700 hours it will be unnecessary to insure it against crash risk beyond that period. It is also obvious that it is unnecessary to insure a machine against crashes right up to its full value if the machine has done, say, 699 hours' flying. B (i) should therefore be estimated on a sliding scale, or, for the purpose of averaging, the figure of one-half of one-sixth—or one-twelfth—per cent. per flying hour may be taken as an equitable basis.

B (ii)—Deterioration. This factor may be considered as stated one-seventh of one per cent. per flying hour. In adding the above figures together we find that on an aeroplane detailed to carry out certain operations lasting six months and entailing 300 hours' flying, the cost of the machine being 10,000 doll., depreciation should be figured as under :—

B (i)—Crash risk—one-twelfth of one per cent. per flying hour for 300 hours	2,500 doll.
B (ii)—Deterioration—one-seventh of one per cent. per hour for 300 hours	4,286 doll.
Total depreciation	6,786 doll.

If the machine is stored in a hangar for the balance of the year we will get the additional cost of :—

A.—Constant depreciation—3 per cent. per month on 10,000 doll. for six months	1,800 doll.

In other words, the total allowance which should be made in calculating cost of operations or insurance and depreciation upon a new machine valued at 10,000 doll. and used for operations for a period of six months, during which it was flown 300 hours, would be 6,786 doll., or sixty-seven and four-fifths per cent. of the value of the machine.

It is particularly emphasised that the above calculations are based on war-type machines and with war-time experience. These figures will unquestionably be greatly modified as the present types of machines give place to those designed for commercial uses and as the attitude of mind created by war experience is altered under peace-time conditions.

The reader of these figures will naturally be inclined to doubt them; certainly this figure is very large, but experience goes to prove that it is at least approximately correct. The business man unfamiliar with the use of aircraft will immediately state that depreciation is so large as to rule out aircraft entirely as a feasible mode of transport. This I do not believe to be the case, but the estimating of the cost of operations in various parts of Canada has made it clear that if aircraft has to be used economically, every machine must be flown to its maximum capabilities. In other words, machines must not be allowed to "eat their heads off." For example, in figuring up the cost of operations of six aeroplanes flying in all 120,000 miles, it has been found that the figure for depreciation was as low as 16.6 cents per mile out of a total of 62.7 cents per mile. In another instance, where only 50,000 miles of flying was required, the depreciation amounted to 96 cents out of a total of 2.04 doll. per mile. Various other examples go to show that the more flying that is done the more reasonable both depreciation and operation costs become.

During the war no attempt was made to build a machine in such a way that this figure would be reduced. The life of an aeroplane on active service was exceedingly short, whether it came to its end by crash risk, by deterioration, or at the hands of the enemy; few machines on active service lasted much over 100 hours, hence a machine designed to stand 1,000 hours' work was merely a waste of energy. Now that the war is over, however, and aircraft manufacturers are turning their attention to the commercial use of aircraft, serious efforts are being made to design and build machines that will last for upwards of 1,000 hours. Prominent in this direction is the advent of the all-metal machine. Already very satisfactory wings have been made which, while increasing the weight only 10 per cent. over the present methods of construction, give a factor of safety of 12 instead of 6. In England to-day the largest machine ever constructed is being built of metal, and it is hoped that in this and subsequent types the life will be very much lengthened. Unquestionably this is the greatest problem facing aircraft manufacturers to-day and one that will retard the commercial use of aviation until it has been satisfactorily solved.—Ottawa, May, 1920.

A Criticism.

The foregoing document is of very considerable interest. It is probably true to say that were the writer to resume his inquiries in England to-day he would be able to discover those who possessed very considerably more in the way of accurate information as to the depreciation of aircraft on commercial services than was available at the time his original inquiries were made. Whether he would be able to extract that information in any very useful form and, still further, whether he would be permitted to publish it, is a quite other matter.

But there are certain points whereon remark may usefully be made as to his statements, and very possibly the writer himself would now amend his views in certain respects.

On one issue a very distinct objection may be taken to his assessment of costs. This relates to the question of obsolescence. Financially, the scrapping of an obsolete type of machine is justifiable only when the substitution of a more efficient type will result in economies or in increases of revenue sufficient to pay interest on the capital represented by both the original and the new types of machines.

The sale value of an aeroplane—regarded purely as a commodity—will undoubtedly drop with its age, quite apart from any question of its material deterioration. But as part of the equipment of an aerial transport concern its value is properly what is generally known as a going concern value, and is entirely a function of its revenue earning capacity.

This capacity may fall through material deterioration of the machine itself—but is then due to faulty upkeep—or it may fall through the competition of other concerns operating on the same or equivalent routes and employing more efficient types of machine. But if an aeroplane to-day can carry a given load over a given route at a given cost, there is no factor due to the age alone of that machine that will prevent it from carrying the same load over the same route at the same cost ten or twenty years hence.

To charge obsolescence as a cost is to burden the present with the cost of problematical future improvements, and in the development of commercial aerial transport represents an entirely wrong and shortsighted financial policy. To build up out of any profits available a reserve fund to facilitate the substitution for old type machines of newer and more efficient types is an entirely different affair, but to treat this item as a cost is merely to introduce one more deterrent to the growth of the business, and hence probably effectively to remove any excuse for so replacing them.

For the remainder of the contents it may fairly safely be said that the figures given for the life of commercial aircraft are all distinctly conservative. Quite possibly the depreciations which result may approach fairly closely to the allowances necessary with existing types of aircraft operating on irregular services over bad country, but British experience of machines operating over regular routes and subject to proper arrangements for maintenance and overhaul would seem to indicate an average flying life of very much more than the 600 hours assumed by the writer. Given competent piloting over routes not worse than the London-Paris as regards facilities for landing, and modern engines properly maintained, it seems probable that at least 2,000 flying hours without a serious crash can be counted on with fair certainty—W. H. S.

AN ABSTRUSE PROBLEM.

The following letter has been received :—

Sir,—In Air Ministry Notice to Airmen, No. 105 of the year 1920, the following statement occurs :—

> "In the south-west corner there are the repair shops, offices and hangars; the easterly part of the aerodrome is taken up for landing; and in the south-east corner there runs a stream of water and a tall hedge. On the west side there is a landing-mark—an equilateral triangle marked in white, the apex being to the north."

I should be glad if you or any of your readers could inform me which corner of an equilateral triangle constitutes the apex, or should my inquiry be addressed to the Air Ministry?

(Signed) "EARNEST INQUIRER."

[This query should obviously have been addressed to the Directorate of Research, Air Ministry, Kingsway, W.C.2. —Ed.]

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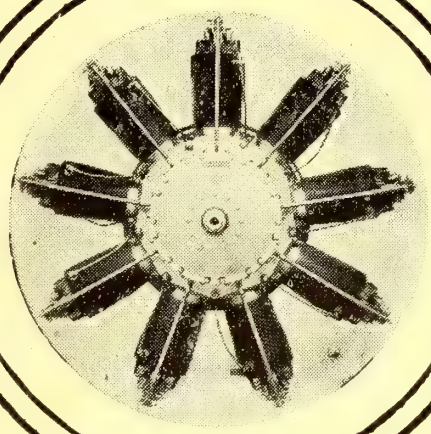

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TRADE NOTES.

A Real Commercial Economy.

One of the most expensive of expendable adjuncts of aviation is the airscrew. Everyone knows what happens to one of these after passing through a hail storm, or even a severe rain storm, or even a slight accident such as a machine gently standing on its nose. With the ordinary type of wooden airscrew there is usually under such circumstances a complete "write-off" of £30 Also one is told that the life of a wooden airscrew in such hot climates as that of Egypt or India is very limited.

Therefore it is most encouraging to note that a satisfactory airscrew made entirely of metal has been evolved by the Metal Airscrew Company, Ltd , of Regent House, Kingsway, London. The screw is made so as to have an adjustable pitch and each blade is balanced separately besides being renewable separately. One learns that an airscrew which was designed for a 70-h.p. engine was "revved" up to 340-h.p. with quite unspectacular results.

It is not surprising to find that an order has been placed by the Air Ministry for these screws for machines operating on water and in hot climates. All those interested in the economical running of an air line should pay a visit to the offices of the company, which are about twenty-five seconds' walk from Holborn Tube Station.—G. D.

Cinematography and Aviation.

Cinematography has come to be regarded by the general public as a means of comparatively cheap amusement, but in spite of all that is said of it by certain magistrates presiding over children's courts, its uses from an educative, pictorial and research point of view are many. From an aeronautical standpoint it has similar uses, and during the late war a considerable amount of work was accomplished and endless experimentation carried out.

With the advent of more normal times its uses have been considerably amplified, and, together with the amount of experience gained, a very large sphere of operation is now open to it.

Among those very few manufacturers of cinematograph cameras, the establishment of J. Debrie, of 111, Rue St. Maur, Paris, have probably come to be recognised as the premier producers of high-class apparatus.

For ordinary straightforward aerial cinematography their "Parvo" camera can be claimed to be the best suited for the purpose.

With its reduced dimensions, it is the smallest of all cameras extant, it is always ready, the film boxes are inside, thus obviating the danger of fogging the film, nothing sticks out of the camera itself; this last, but not least, advantage making the "Parvo" one of the handiest and most convenient cameras to be carried.

During the war the British War Office experimented with film cameras that instead of taking 16 pictures per second, which is the normal speed of taking, speeded up the operation some few times, so that on projection at the normal speed the speed of the subject taken should be slowed down by the same number of times as it was originally accelerated, thereby disclosing much movement that was unobserved by the naked eye.

To obtain results that were worth their while, it was found that no camera would stand up to the work for any length of time.

Since the war Pathé Frères have introduced films produced on that principle with a camera known as the "Ultra-Rapid."

J. Debrie have now produced a modification of their "Parvo" camera which is far in advance of anything yet produced, and takes pictures at the rate of 250 per second, so that on projection at the normal rate of 16 pictures per second, slows down the movement of objects taken 15⅝ times. By this means, it is possible to observe many things that hitherto have been merely the subject of assumption. The first film produced by this camera portrayed, among other things, the flight of gulls, at both the normal and reduced speeds, a subject of great interest to all concerned with the problem of bird-flight, etc.

It is unnecessary to lay any stress on the huge possibilities introduced by this camera for purely research work, such as wind-tunnel experiments and the observation of the passage of smoky air round models, the action of valve springs, wood fractures under stress, etc.

Again, a fair amount of cinematography has been done from the air, but the clearness of the picture has often been marred by the excessive movement caused by the unsteadiness of the aircraft which at the best of times can hardly be claimed as an ideal "platform" for continuous aerial photography. By the utilisation of this Rapid "Parvo" camera, the sudden movements would be damped down to such an extent as to render them hardly noticeable, and the passage over places taken would be slowed down to such a pitch as to allow points of interest to be seen clearly.

The novelty and utility of aerial cinematography under these conditions should be of great commercial value.

Anyone interested in this camera should get into touch with Pearson and Sopwith, Ltd., of 8-9, Long Acre, London, W.C., who hold the sole agency in this country for all the products of J. Debrie.

Foreign Service.

Mr. D. C. Hutchinson, of Titanine, Ltd., has recently paid a visit to Madrid in the interests of ths firm. After an experience of the Spanish railways he is more than ever convinced of the desirability of aerial transport.

Marconi in the Air.

Major-General Sir F. H. Sykes, C.B.E., K.C.B., C.M.G., Controller of Civil Aviation, in his address before the Air Conference, impressed upon aviation transport firms "the great importance, in the interests of safety and regularity, of every commercial machine being equipped with wireless," and quoted as an instance of the utility of such an equipment the recent case in which an aeroplane with ten passengers aboard was able to ask from the air for landing lights when forced to land at St. Inglevert after dark.

It is interesting in this connection to learn that nine of the aeroplanes engaged in commercial services between England and the Continent have already been equipped with the Marconi wireless telephone and that others are now being similarly fitted.

A Plus Quantity.

On Oct. 7th seven of the leading London morning papers between them devoted 35½ inches of their valuable space to more or less intelligent accounts of the liquidation of the Sopwith Aviation Co., Ltd., under such headings as "Sopwith's Heavy Loss," "Sopwith Co.'s Losses," and "Sopwith Liquidation," and so forth, but none of them, so far as one could see, devoted so much as an inch to recording the real progress of aviation.

No paper had the intelligence, for example, to understand that the formation of the new de Havilland Aircraft Co., Ltd., is a very much more important thing on the plus side of the progress of aviation at the moment than is the liquidation of the Sopwith Aviation Co. on the minus side. Our Press does not seen to appreciate the fact that Capt. de Havilland has always produced new designs which have made for progress and that his D.H.16 and D.H.18 machines are to-day in the very forefront of commercial aircraft.

For Scored Cylinders.

In these days of soaring prices it is interesting to hear of a process that will effectively repair scored cylinders at a minimum cost. This is to-day being achieved by the Barimar Metallurgical Process, and is undoubtedly without parallel in the salving of scrapped castings. In pre-war days the only reliable method of rendering scored cylinders thoroughly efficient was to weld up the scores, regrind bores, and then fit new pistons complete. Such an operation was a costly one and the work took some four to six weeks to complete.

To-day large quantities of cylinders scored in this way are being successfully treated by this newest invention, the Barimar Metallurgical Process, for a figure which is only about 10 to 20 per cent. of the cost of the old method, and the work is finished in about two days. A further point, and one of paramount importance, is that when cylinders are repaired by this process they do not have to be welded or reground, and they do not require new pistons.

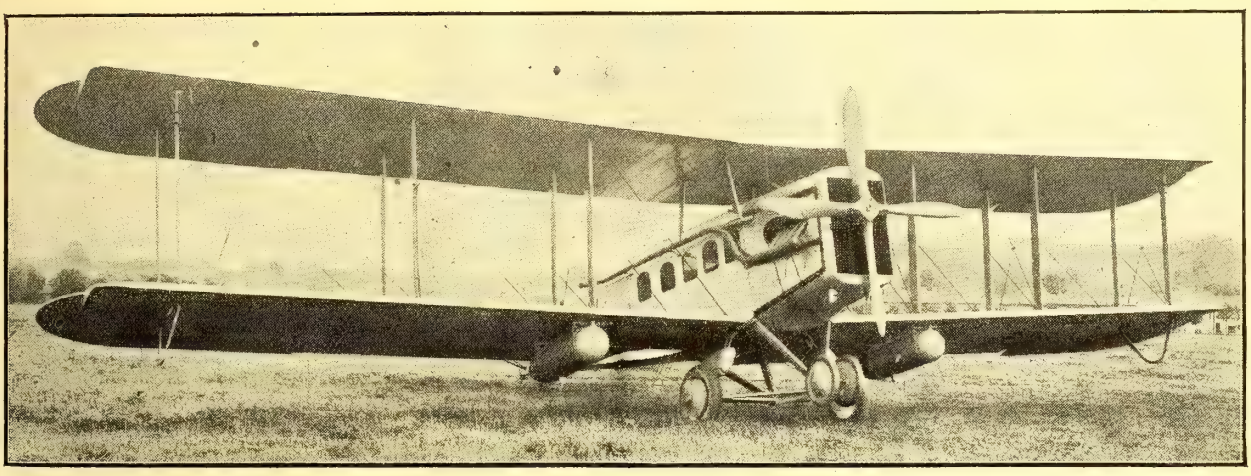
COMPANY NOTES.

Mortgages, Charges and Satisfactions.

Whitehead Aircraft (1917), Ltd.—Four charges, dated Sept. 17th, 1920, to secure £2,500, £1,900, £1,000 and £1,250 respectively. Property charged: company's property, present and future, except uncalled capital. Holders: O. Sunderland, 15, Eastcheap, E.C.; R. H. Tetley, 50, Jermyn Street, S.W.; Morris Veasey and Co., King Street, Cheapside, E.C.; and C. F. Oldham, Falklands, Feltham.

Aircraft Manufacturing Co., Ltd.—Particulars of £25,000 debentures authorised Sept. 28th, 1920, whole amount issued; charged on the company's undertaking and property, present and future, including uncalled capital.

WESTLAND



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(2) **GREATEST SPEED RANGE.**

(3) **BEST ECONOMY:—**

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Lowest Oil Consumption irrespective of B.H.P.

(4) **RELIABILITY.**

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AeroEngines

(*Continued from page 670.*)

He wanted a subsidy because of the depreciation of machines so that they could be written off quickly, and thus pay for progress. He suggested wittily that the telegraph services had a subsidy, only instead of receiving it at the beginning they made a loss at the end of the year and called it a deficit. He also suggested that the petrol and oil companies which made such vast profits might supply free petrol and oil to the air lines instead of paying Excess Profits Duty.

He drew attention to the fact that the proposed amount of subsidy to the air lines was, after all, only equal to the money which had been saved by the Government by not allocating the First Prize in the "Large Aeroplane" Class in the Air Ministry Competition.

He considered that the cost of administrating Civil Aviation by way of the Air Ministry was rather high for the amount of work which it had to regulate. He considered that the Aircraft Industry needed a little more feeding bottle and a little less policeman.

A New Force in Aviation.

Mr. Frank Searle, now managing Aircraft Transport and Travel, Ltd., and formerly the creator of the Daimler Hire Department, who is most distinctly a new force to be considered in the future development of Civil Aviation, made one of the best speeches of the Conference.

He remarked that Civil Aviation hitherto had been handled by aero-optimists. Nobody could make a profit out of two-seater or four-seater aeroplanes, and in any case aircraft would not cater for workmen's fares. Even if the present fares were high, a £2,000 a year employee going on a special journey to Paris would save two days of his valuable time, which is worth at any rate £10 per working day, and that alone paid his fare.

As to the practical side of Air Lines he said that pilots ought not to fly by eye and without wireless. The ground organisation of the wireless system badly needed overhauling. (This is a subject with which one hopes to deal further.) At present it was impossible to fly by night, and it should be possible to use machines for 10 hours a day to make them profitable. Therefore the Air Ministry should light the air routes adequately.

The use of turn indicators should be made compulsory. Some method should be devised of indicating the height of a machine from the ground and not from sea level. Engines ought to do more than 3,000 miles without overhaul.

On the subject of profit-making he pointed out that a D.H.18, which cost £5,000 to buy, could carry £160 of fares in the double journey Paris and back in the day. This showed a profit of £100 a day, and the machine could be written off in three months. War machines were useless as profit makers.

He was surprised at the unpractical details of aeroplanes. He found six rubber connections in the petrol system of one aeroplane. He know from experience that one rubber connection in a certain type of motor 'bus resulted in 'buses being stranded all over London. Why not use steel pipes? Why fix engine cowls with skewers instead of proper clips? Why use cables in controls instead of rods? Why put magnetos where they were deluged in oil?

Mr. Searle was continuing in this eminently practical and informative vein when Lord Montagu pulled him up short under the ten minutes rule, though he had permitted quite uninteresting people to talk at large during the morning. One suggests to the Royal Aeronautical Society that Mr. Searle be invited either to read a paper, or merely stand up and say what he thinks about Commercial Aviation, to the Society. The Aircraft Industry will learn quite a lot about practical commercial aviation if he is kind enough to do so.

Mr. Searle, having been "sawed off close to the ground," as somebody put it, the Meeting proceeded to pass the following resolution, proposed by Mr. Holt Thomas and seconded by Sir Sefton Brancker :—

> "That this Conference calls upon the Government to decide definitely that all first class mail matter shall be sent by Air Mail on mail routes of importance."

And the morning and the evening were the first day.

THE SECOND DAY'S PROCEEDINGS.

The papers for the second day were read by Air Vice-Marshal Sir E. L. Ellington, Director General of Supply and Research, and by Captain F. S. Barnwell, of the Bristol Company. These, being essentially technical papers, are dealt with by Captain W. H. Sayers in the "Aeronautical Engineering" section of this paper. Captain Sayers has a good deal to say on the subject of the apocryphal steam aeroplane, and also on the discussion which followed Air Vice-Marshal Ellington's paper.

After the first paper, that distinguished gentleman whom a wag called "Sir Rippling Glazebrook, who goes on for ever," delivered a long discourse which had little enough to do with the paper. This curtailed unduly what promised to be a very interesting discussion, which had in any case to be cut short, as those present at the Conference were to be taken in motor 'buses to London Bridge Station, thence by train to Waddon, and thence by motor 'bus to the London Terminal Aerodrome.

There the guests were excellently entertained at lunch, Trust Houses having mobilised a large staff to deal with the crowd, having evidently learned much from the previous Sunday. Quite a number of people who were not at the Conference appeared at the Aerodrome, among them being Mr. Robert Williams, Secretary of the Transport Workers' Union, and Mr. Ben Smith, of the Vehicle Workers' Union. With the exception of those two notable gentlemen one did not notice anybody else at Croydon who was not already concerned more or less intimately with aviation.

The demonstration of flying was excellent. The prize-winning machines in the Air Ministry Competitions were present and put up a very fine performance, all except the Supermarine, which was unfortunately held up by fog at Southampton. The Fairey, piloted by Lieut.-Col. Nichol, managed to get through from Hamble.

Everybody who is anybody in aviation was at Croydon, but one ventures to suggest that the excellent display of flying which took place would have been much more useful if everybody who is nobody in aviation had been present instead.

A Suggestion to the Air Ministry.

One suggests to the Air Ministry that similar exhibitions of flying should be given, preferably on Sunday afternoons, to selected groups of guests chosen because they represent some particular trade or profession which would be directly benefited by a proper understanding of the value of Commercial Aviation. For example, it would do well to start with the editors (not reporters) of the British trade and technical journals, so that they themselves may be converted to a belief in aviation and may preach the gospel to the trades which they respectively influence. One such successful visit would do more good to Commercial Aviation than the whole of the Air Conference has done.—C. G. G.

ANOTHER KIND OF CONFERENCE.—Prominent among the free-lunchers and free joy-riders at Croydon during the visit of the Air Conferenciers were Mr. Bob Williams, of the Transport Workers' Union (left), and Mr. Ben Smith, of the Vehicle Workers' Union (right). Opinion among the aviators at Croydon was divided as to whether the visit was concerned with bringing Air Transport and Aerial Vehicle workers into their Unions, or whether they were there preparatory to calling a strike of pilots, seeing the ex-officer pilots are paid about as much as a van-driver—for the very good reason that Air Transport firms are not making enough to pay more.

IMPRESSIONS OF THE CROYDON DEMONSTRATION.

Doubtless many of those on the 13.10 train which left London Bridge for Waddon on the 13th inst. have at various times in their perhaps somewhat chequered careers been blessed (or cursed) with many different kinds of escorts, ranging from a corporal and two men to a bevy of "armoured B.E.2cs" (as one has seen this curious spectacle described in operation orders). Speaking for oneself, however, one has never before had two perfectly good airships of the size of the R.32 and R.33 detailed to look after one's own personal comfort as did these ships which kept those travelling in the cruelly slow train amused. Otherwise one might have been very bored. One liked the little man in the tail of R.32. On arrival at Waddon the party were conveyed to the aerodrome in a fleet of motor 'buses. Airshipping was also prominent inside the 'bus which conveyed oneself. One is glad that the R.33 delayed its "shower of pickle-jars" publicity stunt until the following day.

On arrival at the aerodrome cold lunch was served in the quondam officers' mess building. The crafty idea of having separate rooms successfully checked the prevailing epidemic of speechifying. One was glad to see that the modest liquid tastes of many people saved the Department of Civil Aviation sixpence per head.

One noticed a lifelike representation of the famous Mr. Mutt while feasting. Mr. Jeff was also present. The Department of Civil Aviation are very lucky in obtaining the originals from Mr. Fisher.

After lunch one saw Mr. Courtney armed with a butterfly-net trying to catch the R.33 in order to try out a new departure in semiquaver landings. At that moment a Vickers "Vimy" and "Viking" both arrived, wing tip to wing tip. The undulatory landing of the Viking caused Mr. Courtney to remark, "Oh, look at the waves!" The departure of this ship made those gasp who did not know the quality of the pilot, the machine and the Napier engine.

The arrival of the Handley Page O/400 and W.8 was most dramatic. They both arrived simultaneously over the aerodrome separated by a rod, pole, or perch. The W.8 apparently suddenly got fed up with ballooning and opened out, leaving the old O/400 standing. Shortly after this Lieut.-Col. Nichol arrived on the Fairy Amphibian, also finding the sea a trifle rough at his first *atterrissage*. The D.H.6, belonging to the Leatherhead Aviation Company, made quite the most spectacular, and, if everything done was intended, the most skilful landing of the day.

Mr. Forson, on the D.H.18, and Mr. Barnard on the "Vimy" were both performing with their usual skill. These two machines were particularly admired because they were known to be regularly on the service and not merely over for the day. The magnificent B.A.T. belonging to the I.A.L. was also out. It is a pity there are not more of this type built as they would be of real service to aviation. They were, of course, built by one of the companies organised by Sir Samuel Waring, Bart., who received his baronetcy for his services to aviation.

Through the kindness of Mr. Cogni one made the trip back to Cricklewood in the W.8. The amount of "vim" imparted to this handsome machine by the twin Napier engines is really most remarkable. She flies more like a scout than a "Fat Porter." She would be greatly improved by having larger windows fitted. Major Brackley's handling of the W.8 was wonderful.

The Avro triplane, which was flown at Croydon by Mr. Hinkler, caused wonder among the uninitiated owing to its being a triplane. The big Napier-engined Westland was also much in evidence. One considers it a perfect triumph on the part of any machine to be able to lift Mr. Keep, much less half a dozen passengers. (N.B.—Mr. Keep is at Yeovil, which is a long way from Piccadilly.) The window arrangements are excellent on this machine and can be opened as wide as possible. Mr. Keep points out that the real advantage lies in the fact that one can be as sick as one likes through these. The machine has been sold to a Canadian syndicate for "art: obs." in seal fisheries.

Finally, one must not omit a word of praise for Major Greer's dual performance as "χωρος" and sheep-dog, which was really one of the features of the meeting.—G. D.

CONCERNING HELICOPTERS.

In view of the various entirely opposing views that are held by the leaders of aeronautical science in this country and others as to the value of direct-lift heavier-than-air craft, it is of very great interest to learn that M. Louis Damblanc will deliver to the Aeronautical Society, on Nov. 18th, a paper entitled "The Problem of the Helicopter."

M. Damblanc has been experimenting with helicopters for a number of years, and his recent experiments have proved so successful that the French Government has allocated to him the sum of 300,000 francs to assist his experiments. It will thus be readily appreciated that M. Damblanc is better entitled to lecture on the practical experimentation of the helicopter than is anybody either in France or elsewhere.

Though in fact M. Damblanc has an excellent knowledge of the English language, he prefers not to read his paper himself, and he has arranged with Mr. Percy Noel to read the paper and to act as his interpreter in the subsequent discussion. Mr. Percy Noel will be remembered as the founder, proprietor and editor of one of the earliest American aeronautical papers—namely, *Aero and Hydro*, of Chicago.

Mr. Percy Noel ran that paper until the outbreak of war, when, happening to be in France, he at once joined the Red Cross and did excellent work in the transport of wounded, in many cases under fire. He is thus entitled to wear the 1914 Star, a privilege enjoyed by very few American citizens. Later in the war Mr. Percy Noel acted as war correspondent for one of the most important groups of American papers, and more recently has visited Russia in order to investigate Bolshevism.

Thus it will be seen that both the composer and the reader of the paper on helicopters are among the most interesting personalities in international aviation.

M. Damblanc will illustrate his paper with a number of photographs and diagrams of helicopters, but undoubtedly the most interesting of his illustrations will be his kinematograph films made up from a series of drawings demonstrating how it is proposed that the helicopter aircraft of the future will navigate after it has lifted itself into the air. Even the most convinced opponents of the helicopter admit that such a machine can be made to rise, but they doubt its ability to manœuvre when off the ground, and it will be remembered that Air Vice-Marshal Ellington last week perpetuated the popular belief that if a helicopter ceases to revolve it will fall like a stone.

M. Damblanc has, one believes, excellent and immediate replies to all criticisms, and consequently the lecture should be of more than ordinary interest. All those who are concerned with aviation, whether members of the Aeronautical Society or not, will be welcomed at the lecture; but as, in view of the particular interest of the paper there is likely to be a large crowd (provided that road and rail transport still exists), it would therefore be well to obtain admission tickets beforehand from the Secretary of the Royal Aeronautical Society, Lieut.-Col. Lockwood Marsh, at 7, Albemarle Street, W.1.—C. G. G.

THE NIEUPORT GOSHAWK.

One is asked by Mr. H. Folland, the designer of the Nieuport "Goshawk," to state with reference to the breaking of a flying wire during Mr. James' first flight on this machine that the factor of safety on this machine is six. With one flying wire gone the factor of safety is four.

The machine, of course, belongs to another of the companies of which the moving spirit is Sir Samuel Waring, Bart.

LOW FLYING OVER LONDON.

The following letter has been received:—

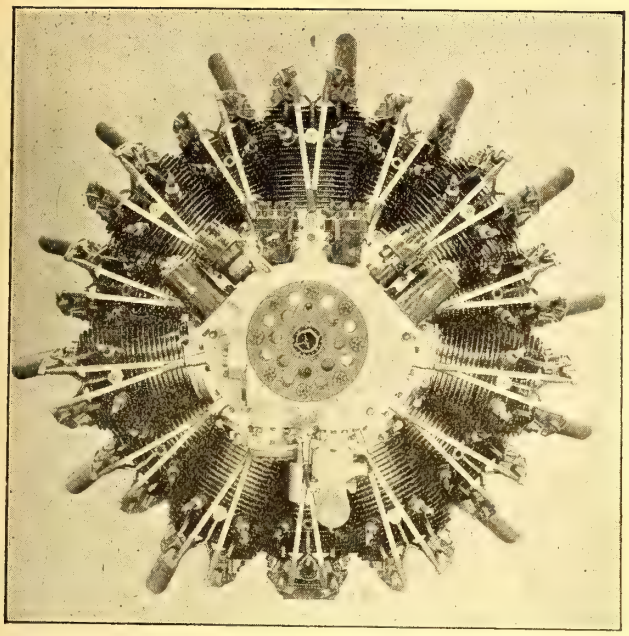
Sir,—It is fairly common for residents in the neighbourhood of Finchley, Golders Green and Cricklewood to see aeroplanes flying fairly low over the housetops, more particularly since Cricklewood aerodrome has been made an air port, but I really think that the limit was reached on the 14th Sept., when at about 7.15 p.m. a Handley Page (G-EASL) passed over Finchley Road and Golders Green Road at a height estimated by myself and a friend at not more than a 100 (hundred) feet.

Isn't it about time that something was done by the Powers that be to pilots on the various Continental air lines who persist in flying low over such crowded areas as those mentioned above? It is, I believe, illegal for anyone to fly low over London, and yet a certain air line, whose machines are very familiar to the public, are persistently breaking the law, not only in the immediate vicinity of their aerodrome, but also elsewhere.

Their pilots, machines and the engines used on their service may be beyond reproach, but accidents may happen in the best regulated of families.

It has already been proved by long service, and also during the late Martlesham trials, that flying on one engine is a bit of a gamble, so that, so long as the practice of gradually losing height on the approach to an aerodrome, which is surrounded by houses, instead of spiralling down when over the 'drome, is permitted, one may look forward to an unholy crash, involving damage to property, if not loss of life, which in the eye of the uneducated public will put back commercial aviation to the days before the war, when aviation was considered but a hobby for those seeking an early exit from their earthly existence.

(Signed) Ex-R.A.F.



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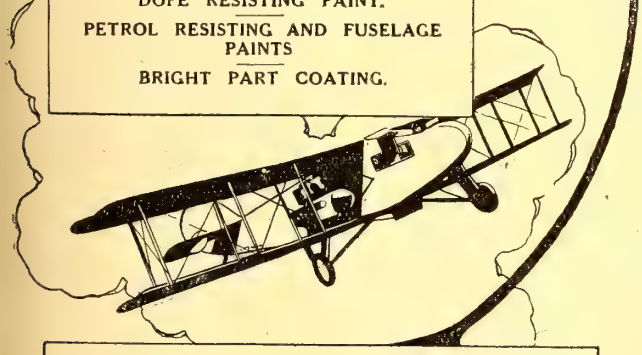

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CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line: next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

OCTOBER 11th:

A.T.T., DH9, G-EAQA, London-Amsterdam, 11.04—. Nil, Nil, Hinchcliffe
A.T.T., DH9, G-EAOZ, London-Amsterdam, 11.04-13.32, G., Nil, Duke.
A.T.T., DH16, G-EAQS, London-Paris, 11.20-13.25, G.&M., 3, Robins.
M.A., Breguet, F-CMAF, London-Paris, 12.20-16.55, Nil, Nil, Chailloux.
C.T., Nieuport, F-CGTY, London-Paris, 15.20-17.55, Nil, Nil, Mauler.
A.P.B., Westland, G-EAJL, London-Paris, 15.35-18.10, G., Nil Campbell Orde.
I.A.L., Bat, G-EAPK, London-Paris, 15.40-18.25, G., Nil, Chattaway.
A.T.T., DH18, G-EARO, London-Paris, 16.00-18.20, G.&M., 3, Forson.
A.T.T., DH18, G-EAUF, Paris-London, 10.30-13.55, Nil, 7, Holmes.
A.T.T., DH9, G-EAQL, Paris-London, 10.55-13.20, G., 1, Baylis.
A.P.B., Westland, G-EAMV, Paris-London, 12.25-14.35, G., 1, McMullin.
M.A., Breguet, F-CMAI, Paris-London, 13.20-15.36, Nil, 3, Martel.
C.T., Nieuport, F-CGTY, Paris-London, 12.20-14.30, M., Nil, Mauler.
G.E.A., Goliath, F-GEAD, Paris-London, 12.35-15.00, G., Nil, Favreau & 1
A.T.T., DH16, G-EALM, Amsterdam-London, 14.33-17.50, G.&M., 1, Lines
A.T.T., DH16, G-EALU, Brussels-London, 14.35-17.00, Nil, 2, Reeves.
A.T.T., DH16, G-EAQS, Paris-London, 15.50-17.45, G., 2, Robins.

OCTOBER 12th:

A.T.T., DH16, G-EASW, London-Paris, 10.38-13.25, G.&M., 1, Reeves.
A.T.T., DH9, G-EAQN, London-Amsterdam, 10.45-13.15, G., Nil, Bamber.
A.P.B., Westland, G-EAMV, London-Paris, 10.50-13.40, G., 1, Powell.
M.A., Breguet, F-CMAI, London-Paris, 12.03-15.00, Nil, Nil, Martel.
A.T.T., DH9, G-EAGY, London-Paris, 15.50-18.05, Nil, 1, Lines.
A.T.T., DH9, G-EAQL, London-Paris, 15.50-18.05, G.&M., Nil, Tebbit.
A.T.T., DH9, G-EAQP, London-Paris, 15.50-18.05, Nil, 1, Robins.
H.P.S., SE5, G-EATE, St. Inglevert-London, 10.40-11.45, Nil, Nil, Foot.
A.P.B., Westland, G-EAJL, Paris-London, —12.40, Nil, 2, Campbell Orde
I.A.L., Bat, G-EAPK, Paris-London, 12.35-15.10, Nil, 4, Chattaway.
M.A., Breguet, F-CMAG, Paris-London, 13.20-15.50, G.&M., Nil, Le Men.
A.T.T., DH9, G-EAOZ, Amsterdam-London, 14.15-18.12, Nil, 1, Bamber.
A.T.T., DH18, G-EARO, Paris-London, 15.35-17.50, G., 4, Forson.

OCTOBER 13th:

M.A., Breguet, F-CMAG, London-Paris, 11.55-14.30, Nil, Nil, Le-Men.
G.E.A., Goliath, F-GEAD, London-Paris, 13.00-16.05, G., 1, Favreau & 1
A.T.T., DH18, G-EARO, London-Paris, 13.20-15.40, G.&M., 4, Holmes.
A.P.B., Westland, G-EAJL, London-Paris, 15.32-17.45, G., 1, McMullin.
A.T.T., DH16, G-EAQS, London-Paris, 15.45-17.45, G.&M., 1, Reeves.
G.E.A., Farman 50, F-GEAV, Paris-London, 09.55-16.25, Nil, 3, Labouchere
A.T.T., DH16, G-EASW, Paris-London, 10.55-15.30, Nil, 2, Reeves.
A.P.B., Westland, G-EAMV, Paris-London, 10.55-13.10, Nil, 1, Powell.
C.T., Nieuport, F-ICGT, Paris-London, 13.20-16.00, M., Nil, Lasnes.
A.T.T., DH9, G-EAQN, Amsterdam-London, 14.17-18.15, M., 1, Duke.
A.T.T., DH9, G-EAQL, Paris-London, 15.35-17.50, Nil, 2, Tebbit.
A.T.T., DH9, G-EAQP, Paris-London, 15.37-17.55, Nil, 2, Lines.
A.T.T., DH9, G-EAGY, Paris-London, 15.40-17.56, G., 1, Robins.

OCTOBER 14th:

A.T.T., DH9, G-EAPL, London-Amsterdam, 10.35—, G., Nil, Bamber.
A.P.B., Westland, G-EAMV, London-Paris, 10.40—, G., 1, Campbell Orde
A.T.T., DH16, G-EALM, London-Paris, 11.00-13.35, G.&M., 3, Milnes.
A.T.T., DH9, G-EAOZ, London-Amsterdam, 11.30—, G., Nil, Lines.
I.A.L., Bat, G-EAPK, London-Paris, 13.35-16.25, Nil, 1, Chattaway.
C.T., Nieuport, F-ICGT, London-Paris, 13.45-16.30, Nil, Nil, Lasnes.
A.T.T., DH18, G-EAUF, London-Paris, 15.35-18.10, G.&M., 4, Forson.
A.T.T., DH18, G-EARO, Paris-London, 12.00-14.20, Nil, 6, Holmes.
A.T.T., DH16, G-EAQS, Paris-London, 12.05-14.00, G., 3, Reeves.
M.A., Spad, F-CMAY, Paris-London, 12.25-14.28, M., 2, Bourdon.
A.P.B., Westland, G-EAJL, Paris-London, 12.30-14.52, G., 2, McMullin.
H.P.T., HP, G-EATJ, Paris-London, 13.10-16.45, G., 3, Jones & 1.
M.A., Breguet, F-CMAG, Paris-London, 13.50-16.31, Nil, 2, Le Men.
A.T.T., DH16, G-EALM, Paris-London, 15.45-18.00, G., 2, Milnes.

OCTOBER 15th:

A.T.T., DH16, G-EASW, London-Paris, 10.00-1640, G.&M., Nil, Robins.
A.T.T., DH9, G-EAQL, London-Amsterdam, 10.25-13.15, G., Nil, Duke.
M.A., Spad, F-CMAY, London-Paris, 15.14-17.15, Nil, 1, Bourdon.
A.P.B., Westland, G-EAJL, London-Paris, 15.25-17.48, G., Nil, Powell.
A.T.T., DH18, G-EARO, London-Paris, 15.40-18.00, G.&M., 6, Holmes.
I.A.L., Bat, G-EAPK, Paris-London, 14.00-16.48, G., 2, Chattaway & 1.
A.T.T., DH18, G-EAUF, Paris-London, 14.05-1632, G, 4, Forson.
A.P.B., Westland, G-EAMV, Paris-London, 14.10-16.40, G., Nil, Campbell Orde.
M.A., Breguet, F-CMAF, Paris-London, 14.15-1720, G.&M., 1, Chailloux.
A.T.T., DH9, G-EAOZ, Amsterdam-London, —17.20, Nil, Nil, Lines.
A.T.T., DH9, G-EAPL, Amsterdam-London, 14.05-12.50/16, Nil, Nil, Bamber.
H.P.T., Ltd., DH4, G-EAVL, Amsterdam-London, 14.40-18.45, G.&M., Nil, Foot
G.E.A., Goliath, F-GEAD, Paris-London, 14.30-18.35, G, Nil, Patin & 1.

OCTOBER 16th:

A.T.T., DH16, G-EALM, London-Paris, 11.15-13.45, G.&M., 2, Tebbit.
A.T.T., DH18, G-EAUF, London-Amsterdam, 11.40-14.00, G., 2, Forson
A.P.B., Westland, G-EAMV, London-Paris, 12.37-15.15, G., Nil, McMullin.
G.E.A., Farman 50, F-GEAV, London-Paris, 12.54-15.50, G., 1, Labouchere & 1.
M.A., Breguet, F-CMAG, London-Paris, 13.13-15.55, G., 2, Le Men.
M.A., Breguet, F-CMAF, London-Paris, 13.15-15.57, Nil, Nil, Chailloux.
A.T.T., DH16, G-EAQS, London-Paris, 15.30-18.00, M., 4, Milnes.
A.T.T., DH16, G-EASW, Paris-London, 10.23-12.35, G., 4, Robins.
M.A., Breguet, F-CMAI, Paris-London, 13.15-15.45, G.&M., Nil, Martel.
A.P.B., Westland, G-EAJL, Paris-London, 15.33-17.42, G., Nil, Powell.

OCTOBER 17th:

A.T.T., DH16, G-EASW, London-Paris, 12.20-1510, Nil, 3, Lines.
G.E.A., Goliath, F-GEAD, London-Paris, 12.25—, Nil, 3, Patin & 1.
A.T.T., DH18, G-EARO, Paris-London, 11.20-13.25, Nil, 7, Holmes.
A.T.T., DH16, G-EAQS, Paris-London, 11.25-14.43, Nil, 1, Milnes.
A.T.T., DH18, G-EAUF, Amsterdam-London, —14.30, M., Nil, Forson.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

OCTOBER 11th:

H.P.T., HP, G-EATG, London-Paris, 12.10-15.55, G., 4, Beal & 2.
H.P.T., DH9, G-EAUI, Bucharest-London, 8/10/20—12.45, Nil, 1, Perry.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.33-17.14, G.&M., Nil, Olley.
H.P.T., DH9, G-EAUP, London-Brussels, 14.38-17.18, G.&M., 2, Halliwell
S.N.E.T.A., DH4, O-BABI, Brussels-London, 14.45-16.53, M., 1, Briere.
S.N.E.T.A., DH4, O-BATO, Brussels-London, 14.45-16.54, Nil, 2, Wouters.
H.P., Avro, G-EAHX, Brussels-London, 15.10-18.25, Nil, Nil, Hill.

OCTOBER 12th:

H.P.T., HP, G-EATJ, London-Paris, 12.33-16.20, G., 2, Jones & 1.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 08.23-12.20, M., 1, Olley.
H.P., SE5, G-EATE, Brussels-London, 16.55 (11th) 13.10, Nil, Nil, Foot.
H.P.T., DH9, G-EAUC, Amsterdam-London, 08.50-12.55, Nil, Nil, Capps.
S.N.E.T.A., DH4, O-BABI, London-Brussels, 14.33—, G.&M., 1, Briere.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 14.33—, Nil, 2, Wouters.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.55-16.45, G.&M., 1, Foot.

OCTOBER 13th:

H.P.T., DH9, G-EAUP, Brussels-London, 14.40-16.45, G.&M., 2, Halliwell
H.P.T., HP, G-EATH, London-Paris, 14.48-17.00, G., 4, Halliwell & 1.
H.P.T., DH9, G-EAUP, London-Brussels, 14.40—, G.&M., 1, Hope.
H.P.T., DH9, G-EAUN, London-Amsterdam, 14.45-16.47, G.&M., Nil, Fowler.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 11.47-11.45, G.M., Nil, Foot.
H.P.T., HP, G-EATG, Paris-London, —16.23, G., 6, Beal & 2.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 14.30-17.23, G.&M., 1, Delzenne.

OCTOBER 14th:

H.P.T., HP, G-EATL, London-Paris, 14.20-17.35, G., 8, Capps & 1.
H.P.T., DH9, G-EAUC, London-Brussels, 14.40-17.40, G.&M., 1, Olley.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.42—, G.&M., Nil, Foot.
H.P.T., DH9, G-EAUN, Amsterdam-London, 14.15-18.15, G.M., 1, Fowler

OCTOBER 15th:

H.P.T., HP, G-EASY, London-Paris, 12.26-15.35, G., 3, Beal & 1.
H.P.T., DH9, G-EAUN, London-Brussels, 14.43-16.45, G.&M., 2, Fowler.
H.P.T., DH9, G-EAUP, London-Amsterdam, 14.52-17.40, G.&M., Nil, Hope
H.P.T., DH9, G-EAUC, Brussels-London, 14.35-17.26, Nil, 1, Olley.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 14.40-18.40, G.&M., Nil, Rigaud.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 15.00(14th) 18.40, G.&M., 1, Van Opstal.

OCTOBER 16th:

H.P.T., HP, G-EATJ, London-Paris, 12.15—, G., 4, Jones & 1.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 15.10—, G.&M., 1, Foot
S.N.E.T.A., DH4, O-BALO, London-Brussels, 14.50-17.10, Nil, 1, Rigaud.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 14.50-17.10, G.&M., 2, Van Opstal.
H.P., DH4, O-20, London-Brussels, 14.50-17.40, Nil, 1, Olley.
H.P.T., HP, G-EATH, Paris-London, 12.33-15.30, Nil, 8, Halliwell & 1.
H.P.T., DH9, G-EAUP, Amsterdam-London, —16.35, G.&M., 2, Hope.
H.P.T., DH9, G-EAUN, Brussels-London, 15.05-17.10, G.&M., Nil, Fowler

OCTOBER 17th:

H.P.T., DH9, G-EAUC, London-Paris, 12.20-15.05, Nil, 1, Halliwell.

Inland Flying at Croydon.

Oct. 11th.—A.T.T., DH9, Bristol return; DH9, two joy-rides; DH16, one test.

Oct. 12th.—A.T.T., DH9, two joy-rides; one Avro test; P.L., Westland 6-seater from Yeovil; A. V. Roe and Co., Avro triplane from Hamble, H.P.T., Ltd., SE5 from Cricklewood.

Oct. 13th.—Private, D.H.6 from Leatherhead return; Fairey Aviation Co., Ltd., Fairey "Amphibian" Southampton return; H.P., W.8 Cricklewood return and two joy-rides; H.P.T., O-400, Cricklewood return; Austin Motor Co., Ltd., Austin "Kestrel" from Birmingham and one test; Vickers Ltd. "Vimy" and "Viking" Brooklands return; R.A.F., DH9a, Kenley return; I.A.L., "Vimy" two wireless tests; four joy-rides; "Bat," one joy-ride; A.T.T., DH9, two joy-rides; DH18, four joy-rides; P.L., "Westland," two tests, two joy-rides; A. V. Roe and Co., triplane, one joy-ride.

Oct. 14th.—Austin "Kestrel" to Birmingham; "Westland" to Yeovil and one test.

Oct. 15th.—A.T.T., DH16 one test; DH9, Lympne return; DH9, joy-ride; H.P.T., HP to Cricklewood.

Oct. 16th.—A.T.T., DH16, one test; "Avro," three joy-rides; G.E.A., Farman 50, one test; H.P.T., DH4, to Cricklewood.

Oct. 17th.—A.T.T., DH16, one test.

Inland Flying at Cricklewood.

Oct. 11th, 12th.—Nil.

Oct. 13th.—H.P.T., HP O-400; H.P., W.8 to Croydon return.

Oct. 14th.—H.P.T., DH9 from Ashford; R.A.F. Avro from Kenley.

Oct. 15th.—R.A.F. Avro to Hawkinge, H.P.T., Handley Page from Croydon; Avro, two tests.

Oct. 16th.—William Beardmore and Co., Ltd, WB8 from Alnwich; H.P.T. DH9 from Lympne, DH4a from Croydon.

Oct. 17th.—Nil

Air Port Statistics.

MACHINES:—					
	Croydon	85	Cricklewood	40	Total 125
PERSONNEL—Passengers:					
	Croydon	129	Cricklewood	67	Total 196
Crews:					
	Croydon	92	Cricklewood	51	Total 143
			Total Passengers and Crews		339

The London Terminal Aerodrome.

Now that the race and the "Binge" are over, Croydon is once more settling down as its natural self. The appearance of the whole station has been much improved by the judicious application of the paint-brush. One cannot help thinking, however, that the money would have better been spent on more tarmac for the "drive" from the sheds to the level crossing. To taxi machines on this track is about as easy as to run a tank on a tight rope. It is so arranged that neither machines from the C.A.T.O. nor A.T & T. hangars can possibly get onto it, so they have ceased trying and carry on as before.

A Farman 50 came on the service again during the week. This machine, which is known as "Violet and Robert," as it has two Lorraines installed, is not unlike the competition Centaur 2a in general arrangement. It seems to be quite fast.

Air Post of Banks are keeping up a wonderfully regular daily service each way with their two machines. They hope to have delivery of the new machines at an early date, when great things may be expected of them.—G. D.

A.T. & T. Notes.

A.T. & T. begin their winter time-table on Monday, Oct. 25th. From that date the Paris machines will leave at 09.30 and 13.00. The Amsterdam service will run as usual until the end of the month and will then cease for the winter.

Mr. Forson was flying the "18" to great advantage on Wednesday. Among his passengers was Mr. Bob Williams, of the Transport Workers' Union, and Mr. Ben Smith, of the Vehicle Workers.

On Saturady Mr. Robins arrived from Paris with a cage of canaries which, owing to their long-haired appearance, he told one were "Persian canaries." During the afternoon an Avro was busy joy-riding. A Napier-engined "16" started off to Paris, the engine giving a beautiful note.—G. D.

The Instone Air Line.

The Bat has been on the Paris service during the week and was much admired on Wednesday during the visit of the delegates from the Air Conference. Both the Bat and the "Vimy" took many of these for joy-rides. On Saturday the personnel of the I.A.L. were busy preparing for possible emergencies brought about by the coal crisis.

Mr. Barnard also tested the Avro triplane during the week. He thinks very highly of this machine, and says that she has been greatly improved since he last flew her.—G. D.

A Quick Journey.

It is reported in the Press that "Major Foote on a Handley Page" aeroplane, variously called a "Lamousine" or a limousine, put up a new "world's speed record" between Amsterdam and London, covering the distance in 1 hr. 50 min.

One imagines that this was Major Foot, of H.P. Transport, Ltd., flying his usual mount, the D.H.4a (G-EAVL). The speed, which works out at about 150 miles an hour, is record for the Amsterdam-London trip, but is far from being a world's speed record.

Birmingham.

The visit of the Berkshire Aviation Circus to Billesley Aerodrome during the last week has resulted in large numbers of people gathering to see the exhibitions of stunt flying which take place daily between 15.00 and 17.00 o'clock at the aerodrome.

Passenger flights are arranged daily at 12s. 6d. each, and about a hundred and twenty people flew for five to ten minutes each during the week-end.

The safety of present-day aviation has been so impressed upon the Manager of the Lanchester Motor Company that he contemplates taking a party from the works for a trip round before the Circus leaves.

The Circus leaves for Stoke-on-Trent on Oct. 25th.—O. F. J.

Brooklands.

The Vickers "Viking III" has been flying fairly frequently at Brooklands during the last few days. Once it was accompanied in the air by a commercial "Vimy," painted all over an aluminium colour. The "Viking" appeared to be considerably faster and more manœuvrable than the "Vimy." At various times both these machines could be seen on the motor track, engines running, and surrounded by a band of mechanics. Up to the present neither machine has attempted to emulate Mr. Hawker's feat of flying under the bridge crossing the track, and a rumour that the "Viking" will be given water tests on the small lake on the other side of the railway has been contradicted.—J. F. S.

Woking.

Some progress has been made in clearing away the debris which resulted from the recent fire at Martinsyde's. Meanwhile the large messroom is being used as a paint shop, and every available space is being utilised.—J. F. S.

FOREIGN INTELLIGENCE.

ITALY.

The Weather.

The elements having continued to put every imaginable climatic stick into the spokes of the wheels of things that fly, the news of the week is chiefly concerned with postponements, fiascos, disasters, and indoor work. For instance, the second day of the L.A.N.'s Stesa Fêtes was a washout owing to the torrential rains. The affair had been postponed on account of the floods already. The chief event of interest seems to have been the brief appearance of the S.A.I.A.M.'s large passenger seaplane, one of several recently acquired and to be put into commission for transport in the Lake District of N. Italy I am told.

Losses.

The loss of a big Fiat machine on a trip to the Varese district with two up, and the loss of another of the Savoia 9s. which was being flown to Finland and has at last been found on a glacier, luckily complete the list of misfortunes.

A F.I.A.T. Meeting.

The F.I.A.T. announce a great meeting of shareholders to face the resignations of the board of directors on Oct. 28th at Turin.

A Papal Bull.

His Holiness by Bull has declared the Blessed Virgin as venerated at Loreto to be the heavenly protector of Italian airmen.

A Guild of Aviators.

Indoors work, mostly in the shape of drawing up the articles and statutes of various companies and guilds concerning aviators, which are legion and hence are wisely federating and combining, has been considerable. The doings in respect of that aerial trust aforementioned have so far got on that certain concerns in it have undertaken the upkeep of certain aerodromes in the international interest of flying. There is much weeding to be done.—T. S. H.

NAVAL AND MILITARY AERONAUTICS.

EXTRACTED FROM WAR OFFICE COMMUNIQUES.

Sept. 27th.—A hostile concentration reported near Kut-el-Hai (25 miles south-east of Kut-el-Amara) was effectively attacked on the 23rd by aeroplanes, who bombed the fort and camps near that place. The machines were fired on, but returned undamaged.

Oct. 1st.—On the Lower Euphrates aeroplanes flew over Samawah on Sept. 28th. No hostile concentrations were observed.

On the Middle Euphrates our aeroplanes flying over Kufah dropped letters, cigarettes, and tobacco, the receipt of which was acknowledged by the garrison by means of Very lights. Our machine-guns were fired at from the town and the encampment. . . .

South-east of Baghdad an aerial reconnaissance on Sept. 28th reported that to all appearances everything was quiet on the Shatt-el-Hai.

Oct. 6th.—On the Lower Euphrates our aeroplanes bombed the rebel camps in Samawa town

On the Upper Euphrates an enemy gathering at Tel Dair (17 miles south-west of Baghdad) was bombed by our airmen.

Oct. 7th.—On the Middle Euphrates aeroplanes reconnoitring over Kufa reported "All well" signals from the garrisons. Bands of Arabs were observed destroying the Kufa-Nejef line.

It appeared that the defence vessel *Firefly*, lying alongside the camp at Kufa, has been burnt.

Oct. 8th.—On the Lower Euphrates . . . reconnoitring aeroplanes report no large hostile forces between Khidr and Samawa; small parties of mounted rebels scattered on being fired at by our machines. . .

The forces which attacked our column near Mahmudie (20 miles south-east of Baghdad) on the 4th were bombed and machine-gunned on the 5th by our aeroplanes.

Oct. 11th.—On the Lower Euphrates the relief column advancing on Samawa has halted for the moment at Khidr. A certain amount of resistance has been met with and a force of about 1,000 Arabs in position south-east of Khidr were defeated by Gurkha and Sikh Infantry, assisted by artillery and aeroplanes. . . . An aeroplane flying over Samawa reports having seen "all well" signal from the garrison. On the Middle Euphrates. . . . Enemy concentrations near Museyib and Hindia Bridges were dispersed by our artillery and another north-east of Hillah by aeroplanes.

Oct. 13th.—On the Lower Euphrates.—On October 10th our aeroplanes bombed the hostile quarters in Samawa town.

Oct. 15th.—Lower Euphrates.—Our aeroplanes again bombed Samawa and its neighbourhood, and also carried out a raid against the camp of the rebel sheikh who was responsible for the firing on our ships at Nasiriyeh .

Middle Euphrates.—The 55th Brigade column, moving out to Tamaziya, a village five miles south-west of Hillah, drove out a band of rebels, but were shortly afterwards attacked by a second force from the south. These also were routed, and a third gathering was later dispersed by aeroplanes.

It is reported that in the air raid on Oct. 8th our aeroplanes attacked and inflicted serious losses on a strong force which had concentrated on the Abbara Canal for the purpose of exacting vengeance from the tribes who had submitted to us

Middle Euphrates.—The 53rd Brigade Column, moving on Tuwairij (or Hinide, west of Hillah, and 11 miles south of Hinide Barrage) also met with considerable resistance.

Our operations were greatly assisted by low-flying aeroplanes, who effectively bombed and machine-gunned the Arabs as they withdrew over the bridge.

Baghdad Area.—Insurgent camps on the right bank of the Euphrates west of Mahmudie were effectively bombed by our aeroplanes on the 12th.

OFFICERS' MEDAL ROLLS.

The Air Ministry announced on Sept. 22nd.—

Medal Rolls of those who have served in the Royal Air Force and have qualified for the British War and Victory Medals are in course of preparation.

Demobilised and invalided officers of the R.A.F.—unless they have already done so—are requested to write immediately to the Secretary, Air Ministry (S.7—Medals), Kingsway, W.C.2, for the necessary form of application (A.M. Form 618). No officer's claim will be considered until this form has been returned completed to the Air Ministry.

Medal Rolls in the case of airmen are being prepared from their documents at the Royal Air Force Record Office, and at present no application on their part is necessary.

H.M.S. "Ark Royal."

It was announced on Oct. 16th that the aircraft carrier *Ark Royal*, Commander R. Watkins Crubb, has received definite orders to return home and pay off. The vessel is on her way to Malta from Aden. H.M.S. *Ark Royal* has been in commission since Dec. 9th, 1914.

No. 35 T.D.S. Dinner.

There will be a reunion dinner for all officers and ex-cadets of No. 35 T.D.S., which was stationed at Duxford, on Nov. 10th, at 19.30 hours. All those wishing to attend are asked to communicate with Mr. H. R. Boosten, Carlyle Club, Piccadilly.

Kenley Common.

It is announced that the Air Ministry will continue to hold the Kenley Common and will acquire for the Kenley Corporation the freehold of an equivalent area of the ground adjoining the aerodrome. This ground will be given to the public. Should the Air Ministry at any time in the future no longer require the Kenley Aerodrome, the land will revert to the Corporation.

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

Major-General Sir W. S. Brancker, K.C.B., will preside at the meeting at the Royal Society of Arts on Thursday, Oct. 21st, at 5.30 p.m. Abstracts of two papers will be read:—"A Comparison of the Flying Qualities of Single and Twin-Engined Aeroplanes," by Squadron Leader R. M. Hill; and "Night Flying," by Major Cecil Baker.

The next meeting will take place on Nov. 4th, when Sir Humphrey Rolleston, K.C.B., M.D., F.R.C.P., will preside at Wing Commander M. Flack's paper on "The Human Machine in Relation to Flying."

ANNUAL DINNER.

The annual dinner will take place between Nov. 12th and 19th, at the Connaught Rooms, Great Queen Street, Kingsway. It is anticipated that the price of tickets, exclusive of wines, will be one guinea. Members are invited to bring guests.

LIBRARY.

The use of the Library has been granted to the Faraday Society for the purpose of holding a meeting at 3 p.m. on Oct. 28th, so that it will not be available for the use of Members.

OFFICIAL ABBREVIATIONS.

The Society has been informed by the Home Office that it is now authorised to adopt the use of the prefix "Royal" in the abbreviations for Fellows and Associate Fellows. These members are therefore entitled to use the letters "F.R.Ae.S." and "A.F.R.Ae.S." respectively after their names, and these forms will supersede those previously used in all official communications

APPOINTMENTS.

Any member aged 20-30, holding an engineering degree and with war service, desiring an appointment, is requested to communicate with the Secretary, who has been notified of a possible opening for a person so qualified. This should not be confused with the vacancy for a draughtsman announced in last week's notices.

Oct. 15th, 1920. W. LOCKWOOD MARSH, Secretary.

THE CAMBRIDGE UNIVERSITY AERONAUTICAL SOCIETY.

The First Session of the Society successfully terminated in March last with some 130 undergraduates and 20 honorary members on its roll. No lectures have been given during the summer months, but in May over 80 members visited the Royal Airship Works, Cardington, Bedford, and some considerable number were to be found at Martlesham during the Competitions.

H.R.H. the Duke of York has graciously consented to become the Patron of the Society. As His Royal Highness, besides being a pilot, has also been up at Cambridge, the Society feels itself greatly honoured to have as a Patron a member of the Royal Family who is so intimately connected with its activities.

The following is the syllabus for the present term:—

Oct. 20th.—Brig.-Gen. R. K. Bagnall-Wild, C.M.G., C.B.E., "Inspection of Aircraft Steels."

Oct. 27th.—J. D. North, Esq., F.Ae.S., F.R.Met Soc. "The Structural Design of Aeroplanes."

Nov. 3rd.—H. Glauert, Esq., B.A., F.Ae.S "Spins."

Nov. 10th.—Public Meeting with Air League of the British Empire. Major-Gen. Rt. Hon. J. E. B. Seely, C.M.G., D.S.O., M.P. "Air Supremacy."

Nov. 17th.—Major J. Erskine Murray, D.Sc. "Communication with Aircraft."

Nov. 24th.—C. I. R. Campbell, Esq., O.B.E., M.I.N.A., A.F.Ae.S. "Rigid Airships."

Dec. 1st.—Capt. F. S. Barnwell, C.B.E., A.F.C., F.Ae.S. "Aeroplane Design, some Present and Future Possibilities."

——.—Visit to H.M. Airship Station, Pulham. (Date to be announced.)

All Meetings commence at 8.30 p.m. Further particulars will be found in the weekly notices.

THE ROYAL AERO CLUB.

ROYAL AIR FORCE MEMORIAL FUND.

A meeting of the Executive Committee was held at 7, Iddesleigh House, Caxton Street, S.W.1, on Sept. 30th, 1920, Lord Hugh Cecil occupying the chair.

Grants in aid of necessitous cases, amounting in all to £607 15s., were passed and payment authorised. This includes a sum of £420 10s. paid on behalf of this Fund by the Flying Services Fund of the Royal Aero Club.

The Royal Air Force Aerial Pageant held at Hendon on July 3rd produced the very handsome net balance of £6,729 6s. 4d., the whole of which has been paid into the credit of the Fund.

Similarly, the Royal Air Force Ball held at the Ritz Hotel on July 8th produced £555 8s. 9d.

Proposals regarding the Royal Air Force Concrete Memorial were held over for discussion at the next meeting.

A scheme for visiting large industrial centres throughout the kingdom with a view to appealing for funds was discussed and referred to a sub-committee.

Numerous letters from the Viceroy of India and Governors of Colonies and Dependencies (in answer to a letter asking for help from the chairman) were read to the meeting.

	£	s.	d.
Amount of subscriptions announced up to July 20th.....	90,166	18	5
Amount received since above date to Sept. 30th, 1920 ...	5,839	2	0
Total to date	£96,006	0	5

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

MILITARY.

WAR OFFICE, Sept. 28th.

REGULAR FORCES.—ROYAL REGIMENT OF ARTILLERY.—R.H. and R.F.A.—Temp. Lt. G. G. Harris relinquishes his temp. commn. on appt. to the R.A.F., May 25th, 1918.

R.G.A.—The following resign their commns. on appt. to permanent commns. in the R.A.F., Aug. 1st, 1919:—Maj. and Bt. Lt.-Col. L. W. B Rees, V.C., O.B.E., M.C., A.F.C., Capt. J. A. G. de Courcy, M.C., Capt. E. O. Grenfell, M.C., A.F.C.

INFANTRY.—Dorset R.—Capt. L. A. Strange, D.S.O., M.C., D.F.C., resigns his commn. on appt. to a permanent commn. in the R.A.F., Aug. 1st, 1919.

AIR FORCE.

AIR MINISTRY, Sept. 28th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—Lt. the Hon. M. H. R. Knatchbull-Hugessen is placed on the retd list on account of ill-health contracted on active service, and is granted rank of Capt., Oct. 1st.

FLYING BRANCH.—Pilot Officer N. Fielden to be Flying Officer, March 30th.

ADMINISTRATIVE BRANCH.—Flying Officer J. M. J. C. J. I. Rock is placed on the half-pay list (Slace E), Sept. 27th

TECHNICAL BRANCH.—Lt.-Col. (actg. Brig.-Gen.) J. G. Weir, C.M.G., relinquishes his R.A.F. commn. on appointment to the T.F., and is granted the hon. rank of Brig.-Gen. (notification in the "Gazette," April 1st, 1919, to stand).

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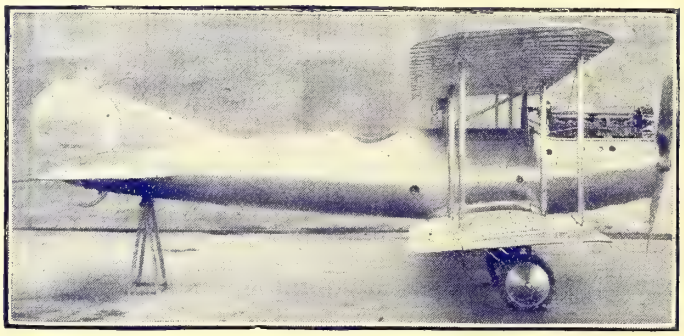

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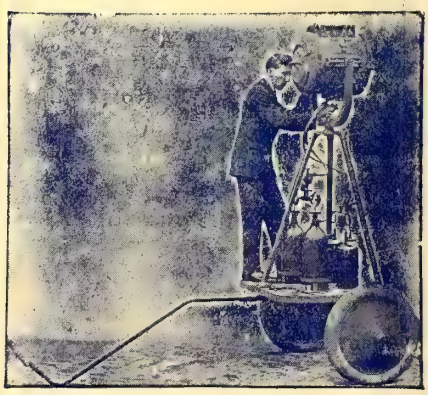

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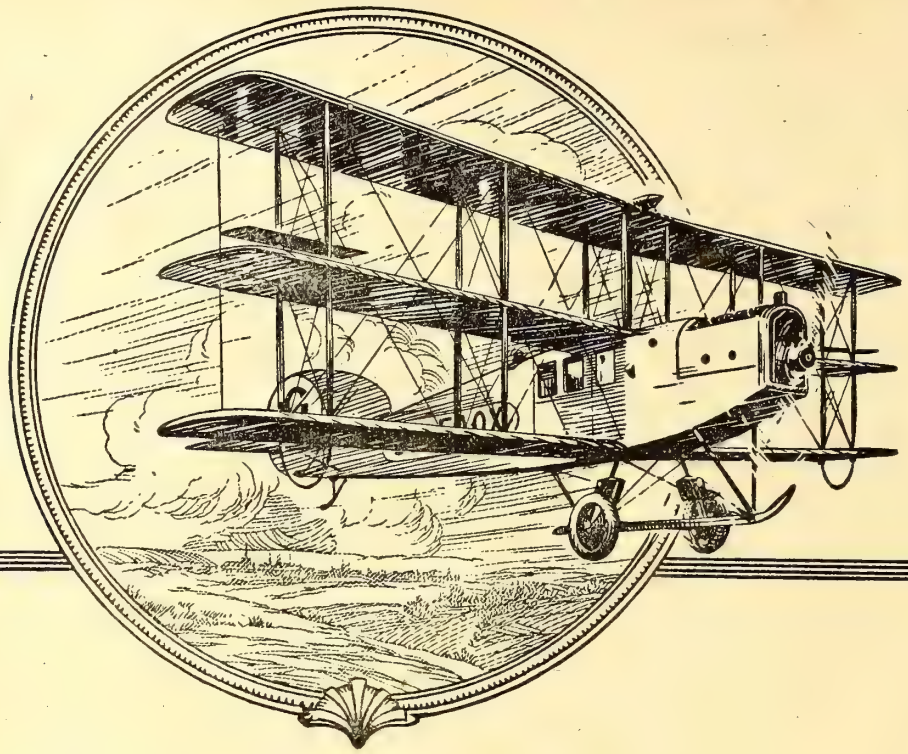

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OCT. 27, 1920.

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ON THE FUTURE OF THE R.A.F.

Whatever may have been their faults of organisation, administration or behaviour, none can deny that the R.N.A.S. and R.F.C., and later the R.A.F., were far ahead of any other Flying Services in the world during the war as a fighting force. To-day, in the present state of semi-peace, it is equally undeniable that the R.A.F. is the strongest, most effective and most efficient Air Force in the world. The British Empire in fact is as truly the dominant Power in air to-day as it was when the Armistice was signed with Germany.

Therefore the future of the R.A.F. is of prime importance to the Empire, and should be of the greatest interest to every person living in what is, despite all its defects, the best Empire ever known in history. These seem to be sufficient reasons for publishing in full the paper read at the Guildhall, to the Air Conference, when Admiral the Earl Beatty occupied the Chair, on the morning of Oct. 14th, by the Chief of the Air Staff, Air Marshal Sir Hugh Montague Trenchard, Bart., K.C.B., D.S.O.

It is of very considerable interest to note that this paper drew by far the largest audience of the Conference. This is doubtless to be explained largely by the high regard in which the distinguished author is held by all concerned with aviation, but it was also due in part to the very real concern which is felt by all soldiers and by the more intelligent sailors for the future of Service flying.

The R.A.F. As It Is.

Before proceeding to the paper it may be well to point out to those who are not now very closely in touch with the R.A.F. that it has become during the past year or so a force of a kind very different from what it was during the later days of the war.

Then it was a huge inchoate mass. The flying personnel were in the main excellent fighting men. They were backed by thousands of mechanics, technical officers, stores officers, production officers, and so forth, mostly very willing, and many very incompetent. As a whole the R.A.F. was fearsomely inefficient, very badly organised, woefully lacking in discipline, painfully devoid of military knowledge and tradition, and generally chaotic. But it held the command of the air in all war areas by sheer weight of numbers and individual fighting power.

During the past year little has been heard in public of the R.A.F. except in War Office communiqués from the Middle East. But during the year much work of the highest value has been done at home. Already, even in the short time since the reforms began, it has become a worthy third of the King's Services, a Service into which the best families may be proud to send their sons. Its tone is generally very much that of the four squadrons of the R.F.C. which existed before the war. That is to say, it is a trifle more free and easy than was the Old Army in time of Peace, and it is a trifle more—may one say?—systematic in its methods than was the Navy.

A modern R.A.F. station is a model of smartness—with very few exceptions. All things are done "decently and in order," in a way which would rejoice the heart of the R.F.C.'s first adjutant, the late Basil Barrington-Kennett. The officers of to-day are the pick of the war pilots, observers and technical officers. The warrant officers are men who distinguished themselves by good work during the war. The N.C.O.s are mostly young men who began as junior air mechanics during the war. And the airmen are either experienced men who had the good sense to stay in the R.A.F. when demobilisation began—knowing that they would thereby learn the great trade of the future—or they are youngsters of an extraordinarily good class who have enlisted since the Armistice, and are thoroughly keen on aviation, mechanical work and the honour of the R.A.F.

Naturally there are exceptions, as there are in all Services. One could, of one's own limited knowledge, point out samples among officers and other ranks who ought to be shot at dawn to encourage the others. But on the whole the average is amazingly high.

Officers who were during the war merely first-class man-killers are working hard to become first-class organisers and administrators. And, likewise, young airmen who are, perhaps, by early training merely mechanics, are working equally hard to become smart soldiers.

That unfailing test of keenness and smartness, the salute, can be passed satisfactorily by any of the personnel at almost any air station to-day. If every sentry, or passing mechanic, salutes his officers properly, and if every officer returns the salutes smartly—and not by a perfunctory wave of the hand or stick—then it is generally fair to assume that there is nothing much the matter with the discipline of that station. And if the discipline is right—that is to say, if it is produced by mutual goodwill between officers and men, and not by mere continual punishment—other things come right by themselves. Given proper mechanical training at the schools, a smart parade-ground means a smart workshop.

It is noteworthy that the young mechanics of the R.A.F. are as keen on ceremonial and observances as are the best of their officers. And it is recognised that the smarter the mechanic in the shops, the smarter is his uniform when he goes a-walking out, and the smarter is his salute when he meets an officer.

Taking it all round, the R.A.F. to-day is a very fine affair indeed. Nobody imagines that it is perfect, but it is working hard to become so. Certain stations which have been inspected by the Chief of the Air Staff have been told that he is pleased with them. Those stations ask for no higher praise, and they do not forget to mention the fact to other stations which have not been so distinguished. Thus a spirit of emulation is arising which will in the end result in the R.A.F. acquiring that quiet air of superiority to all other people which is so offensive to those others and so very healthy—so long as it is justified—to those who wear it.

Already, it is said, the R.A.F. is thoroughly unpopular with the Army on and around Salisbury Plain, because the smart young R.A.F. airmen in their new gray uniforms have quite eclipsed the khaki-clad Mr. Atkinses in the eyes of the feminine inhabitants of those districts. It is a good sign. One hopes to live to see the time when to have been an R.A.F. officer will be at least equivalent to having been an officer of the Guards.

What is being done towards accelerating the arrival of that desirable future may best be learned from Sir Hugh Trenchard's paper, which follows.

ASPECTS OF SERVICE AVIATION.

By AIR MARSHAL SIR H. M. TRENCHARD, Bart., K.C.B., D.S.O.

INTRODUCTORY REMARKS.

The innumerable details connected with a fighting service cannot be dealt with in a morning's discussion, and I propose, therefore, to touch upon some of the aspects only. This opportunity will enable me to explain to a wider public than can be reached by official regulations and pronouncements some of the main principles which are guiding us in the raising, maintenance, distribution and employment of the Royal Air Force.

A Civil Basis.

The test of every fighting service is war. Its organisation, training, distribution and systems of command and administration must always be primarily governed by this consideration. Peace has its own problems and difficulties, financial and other; but in solving them we must always keep war in the forefront of the picture and try to foresee its possibility, probability, locality and nature.

Under modern conditions, no nation can afford to keep its fighting forces, whether they be raised on a voluntary or compulsory basis, at such a strength in peace time as to be able to deal (without expansion) with war on any considerable scale. To a greater or less degree, all the fighting services of to-day must be organised on the cadre principle, and must

have behind them the necessary reserves of trained men and material, with plans for speedy mobilisation worked out in every detail.

These factors affect in varying degree the Navy, Army and the Air Force. The latter is perhaps faced with the hardest problem of all in that its reserves are most difficult to maintain while the most rapid mobilisation is absolutely essential.

In the report of the American Aviation Commission, presented to Congress a year ago, a list of what the Commission described as unescapable conclusions is given, among which are included the following :—

"That any future war will inevitably open with great aerial activity in advance of contact either upon land or sea, and that victory cannot but incline to that belligerent able, first, to achieve and, later, to maintain its supremacy in the air."

"That no sudden creation of aerial equipment to meet a national emergency already at hand is possible. It has been proved within the experience of every nation engaged in the war that two years or more of high pressure effort has been needed to achieve the quantity production of aircraft, aircraft engines, and accessory equipment. The training of personnel, including engineering, production, inspection, maintenance, and operating forces—covering some fifty distinct trades and some seventy-five industries—has proved itself a stupendous task when undertaken upon the basis of war emergency alone."

That is the American view. I don't think any of us who have experience of aviation during the war will be inclined to quarrel with these conclusions.

It must always be remembered that mobilisation does not end war, but only begins it, and that therefore additional provision must be made against war wastage. The difficulties of the Air Service are abnormal in this respect also. The nature of its work makes wastage high, both in personnel and material. The necessity for immediate and intensive training on a greatly increased scale adds to it.

It is obvious that the Royal Air Force, on any financial basis we are likely to be able to afford in peace time, cannot of itself create the reserve of personnel or maintain the stock of material requisite to meet these needs. Great reserves of material present a peculiarly difficult problem, since in addition to being very costly to provide and store, a great deal of such material deteriorates rapidly, and all is liable to become obsolete owing to the rapid development of aeronautical science.

I must here emphasise the point that I am only dealing with the present and the next 10 or 15 years, as after that period development may become more stabilised.

To quote the Report of the American Commission again, a third conclusion reached is :—

"That for economic reasons, no nation can hope in peace time to maintain air forces adequate to its defensive needs except through the creation of a great reserve in personnel, material and producing industry, through the encouragement of Civil Aeronautics. Commercial Aviation and Transportation development must be made to carry the financial load."

One is forced to the conclusion that the Royal Air Force, for a first-class war, must be dependent on outside aid, and what outside aid is possible except Civil Aviation? In the same way, as Sir Frederick Sykes said, that the Navy rely on the Mercantile Marine, but to a far greater extent. Remember, I said a first-class war.

Regarded in this light, the present situation cannot be described as altogether satisfactory, but we must remember that less than two years have passed since the Armistice; and most of those two years have been occupied, on the Service side, in getting rid of war wreckage, old personnel, surplus material and aerodromes, etc.; and, on the Civil side, in exploring the possibilities of Civil and Commercial Aviation. For example, mails might be flown off and onto mail steamers at Aden, Bombay, and elsewhere, thus saving much time. The Naval Constructors at the Admiralty see no difficulty about building ships for such purposes.

Fortunately, mobilisation on a large scale is not, humanly speaking, a problem of the moment, and we may expect that the improvements in transport will prove themselves in Civil Aerial Transport. The train did not replace the stage coach, nor the motor 'bus the horse 'bus completely and suddenly; each had its early years of effort towards commercial efficiency, and there is no reason to be discouraged because the aeroplane seems like to follow the same course.

MORE IMMEDIATE PROBLEMS.

I will now turn to some of the more immediate problems of Service Aviation. Of these the most important are concerned with organisation, the provision of officers and men and planning of their Service careers, the principles of distribution and employment of the R.A.F. units, and the laying down of foundations for the future.

Organisation.

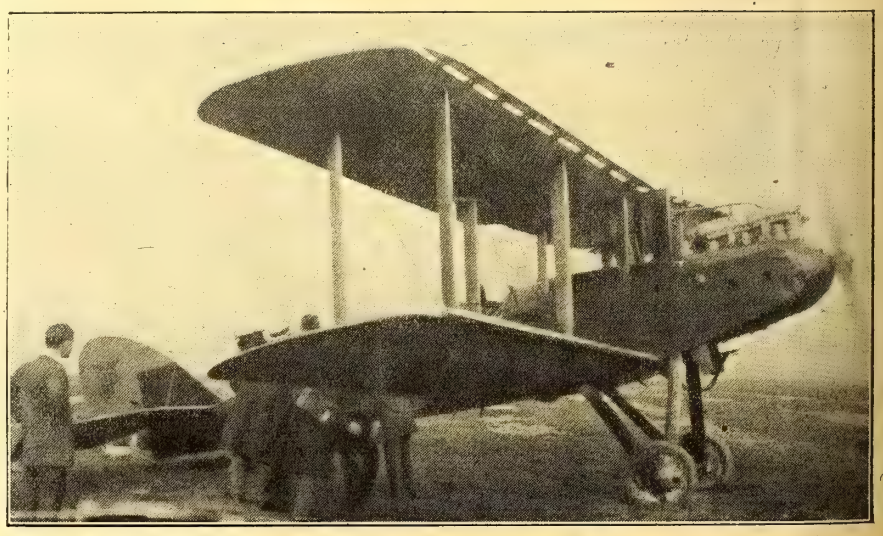
In helping to lay down the organisation of the Royal Air Force in peace it was the endeavour of all concerned to maintain the principles that stood so well the strain of the war, and also to base our organisations on the traditions that were built up during the war. Moreover, while always keeping in view future requirements and possible developments, we have had to watch present needs.

A fighting service may be compared to a fruit tree consisting of roots and trunk, branches and fruit. The roots and trunk are the raw material in officers, men and equip

The Getting-off Angle of the D.H.9 with the Handley Page Wing.

THE HANDLEY PAGE WING.—The first machine to be exhibited to the Public with the new Handley Page wing is seen here. It is a standard D.H.9 with a Siddeley "Puma" engine. The undercarriage is raised a foot or so to give the wings a good angle of attack at starting. The machine, which has the Handley Page patent applied to the leading edges only of its planes, gets off easily in a few yards with its tail-skid trailing on the ground.

The why and wherefore of the Handley Page wing is fully described by Capt. W. H. Sayers on page 701.



ment, the branches are the training and depot organisation, and these two produce the fruit, namely, the fighting units.

The man who plants an orchard of young trees cannot expect much crop for the first few years. If he allows the trees to bear too much fruit in their early years he only weakens them and destroys his chance of a good and valuable crop in years to come.

We are exactly in the same position. As far as possible our aims have been to ensure a well-grown tree with strong and healthy roots, but demobilisation left us with little but roots, and the new growth is still in the sapling stage.

Unfortunately the Armistice did not usher in universal peace, and fighting has been going on in many theatres ever since. We have had, therefore, to a certain extent to force the crop, thereby inevitably retarding growth

To drop metaphor, which is not popular, from what I read in newspapers, demobilisation left us with the bare number of officers and men required, but with neither the pre-war experience, organisation nor resources enjoyed by the older Services.

For instance, we did not have a single permanent barrack on the scale of up-to-date barracks of the older Services, nearly all our buildings being temporary war constructions. The trades of the men did not correspond to requirements after all those who were temporary men were demobilised.

Again, those who were retained were in many cases only liable to a further short term of service, and the training of recruits to take their places had to be commenced at once, and there were few instructors. Also for a long time the size and composition of the Air Force had necessarily to remain undecided, peace establishments could not be drawn up, and even the approximate number of men whom it was required to train in each trade was a matter of guess-work.

The Navy and Army, especially the latter, were no doubt faced with similar difficulties, but not to the same extent. They had their pre-war experience as a guide, and whereas in a battalion the shortage of a few men hardly affects the unit as a whole, in a highly technical service like the Royal Air Force the lack of one essential tradesman in a squadron may seriously affect efficiency.

The Uses of Criticism.

I have only put these considerations before you to give some indication of the complexities of the problem We want criticism and welcome it. The more I see of it the more I know it helps us.

It is sometimes said that criticism should be informed and constructive, and not uninformed and destructive. All I can say is that I have often found that uninformed and destructive criticism more helpful than informed and constructive criticism which I see so much of everywhere.

The greatest trouble we have to deal with is impatience. Probably, all the most useful people are impatient, but I would appeal for a little patience with our Service for its own sake, and, as I said before, in order to make the root healthy in the future. Otherwise our task only becomes harder, the day is postponed on which the Service can be put on a really sound footing. Though probably impatience is good for us, as it keeps us from going to sleep.

Provision of Personnel.

The efficiency of a fighting service depends primarily on its personnel, their *morale* and discipline, their keenness and professional knowledge, and last, but not least, their well-being and contentment.

In considering this aspect of the problem, the fact that we are a new Service helps us in many ways. We can pick the brains of the older Services and profit by their wealth of experience, and we are also unhampered by tradition. It is, however, also a handicap, owing to the uncertainty as to the career offered to both officers and men.

Many questions inevitably occur to those who are attracted by the Service. What is the prospect for the officer as regards his probable position and income in middle age? What will become of the disabled pilot? These questions, and many others, have been very carefully considered, but it is not easy to get into touch with the individual and reassure him.

Official literature is unavoidably tinged with caution, in the matter of promises, and is apt to have more of a repellant than an attractive effect. I therefore welcome this opportunity of filling in a few of the blanks.

First, as regards officers. The nature of the Air Service is such that a large proportion of younger officers and comparatively few older ones are needed. Consequently no Air Force can provide a career within itself for the whole of the young officers it required, and some form of entry for comparatively short terms of service, to supplement the permanent officers is a necessity.

This is equally true, whether the Air Force exists as a separate Service or in its former divided state. Indeed, this fact was recognised both by the War Office and the Admiralty when the special entry schemes were first drafted before the war. I am afraid that sometimes this has been overlooked.

The number of officers given permanent commissions, therefore, has been, and will in future be, limited to the extent necessary to provide for all a reasonable prospect of rising to the higher ranks and earning a substantial pension.

For those who may become permanently unfit to fly by reason of accidents or from other causes the Air Force itself will always provide a certain number of ground billets which do not necessitate flying. And for any who cannot be so absorbed, we are seeking sanction for a liberal scale of disability pensions.

In this connection I think we may confidently anticipate a great reduction in the accident ratio, as I am practically certain that in the next generation there will be no strain in peace flying, other than that inseparable from active service strain.

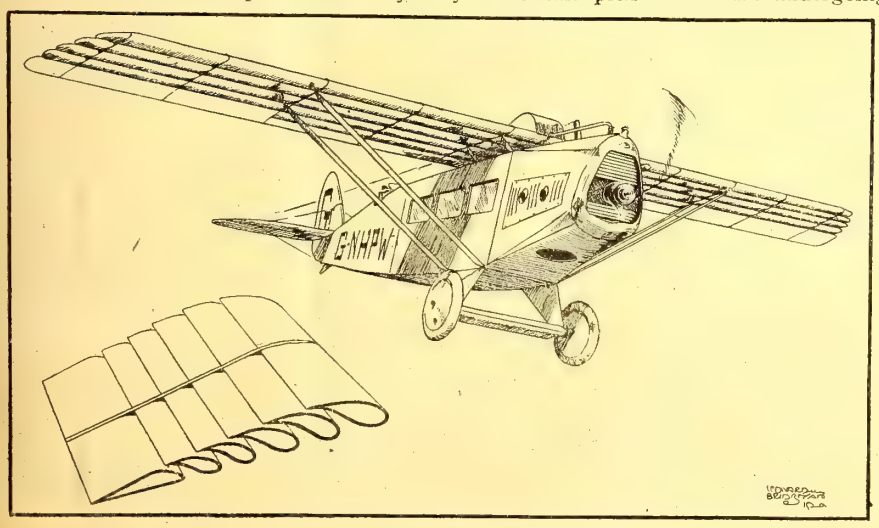
The strain of war flying was great, and the strain of peace flying is, I think, due to the pre-conceived idea of the dangers of flying. War training was, perforce, hurried and intensive, so as to meet the constant call for reinforcements from all fronts, but in peace there is no need for this and training can be longer and more thorough. The development of more reliable machines possessing a greater range of speed, and capable of landing slowly in confined or awkward ground, will similarly lessen the risk for the trained pilot.

"Other Ranks."

As regards "other ranks," we hope to enlist the bulk of our requirements in the long apprenticeship trades as boys. Local education authorities and teachers' associations are extending us their help and support, and I hope, as the advantages and the needs of the Service become more widely known, that we shall have no difficulty in obtaining the numbers we require; but that on the other hand we may look forward to keen competition.

These boys are being given three years' thorough training, both theoretical and practical, at Halton, in their trade. And on completing this will do seven years' colour service.

Vacancies in the short apprenticeship trades will be filled by direct enlistment of men, both skilled and unskilled. The latter are undergoing the periods of training (on the average



WHAT IS RIGHT LOOKS RIGHT.—A sketch of a possible commercial monoplane with Handley Page wings. And a section of the scheme of that wing when developed to its logical conclusion. It will be seen that the complete wing, when applied to an aeroplane, is not unsightly. It conforms to the axiom that if a new idea is right it looks right. The theory and practice of the Handley Page wing is discussed simply and yet fully by Capt. W. H. Sayers on page 701 of this issue.

about twelve months) necessary to make them efficient in their particular trade.

The men required for unskilled labour are similarly obtained by direct enlistment, and we hope it will be found possible to teach a trade to as many as wish to learn one during their service in the Royal Air Force.

General education has not been forgotten. A scheme has been sanctioned for the engagement of civilian teachers on a salary basis which we hope will attract a good proportion of public school and University men. At the Cadet College and the Boys' Training Establishments the scheme is already working, and as our peace organisation takes shape we hope to extend it first to the men's training establishments, and eventually to all training units.

I think I have said enough to show that steps are being taken to ensure that service in the Air Force on a long service basis is not a blind-alley occupation.

Short Service Commissions.

The entry of those officers who can only be taken on a short service basis may prove to be a more difficult problem.

As yet the scheme is only in the experimental stage, since there was no lack of officers who would otherwise have been demobilised, who were willing and anxious to continue serving for another two or three years. The retention of these officers is necessarily a merely temporary expedient, only made possible as a direct result of the war.

Direct Entry for Civilians.

For the future we are, at present, looking to two sources. First, the seconding of officers from the Navy and Army. And, second, the entry of officers direct from civil life on a definite short service engagement who will receive a gratuity and return to civil life on the expiration of their engagement, subject only to a liability to a certain period of service in the Reserve.

These two sources are interdependent, and each is an essential feature of the scheme. Since permanent officers will only be productive of an R.A.F. Reserve to a very limited extent, and seconded officers will not be so at all, the Short Service officer must be the back bone of any reserve designed to meet requirements which do not call for a national effort.

If a large number of officers come forward from the older Services for seconding to the R.A.F. the number of short service commissions offered will be correspondingly less, and so the best material only need be taken. By thus raising the standard of the candidates, the older Services will help to ensure that their Air requirements are met by the best type of officers.

The Seconding System.

The seconding system, moreover, whilst of importance to the Air Force, is also a fundamental factor in the development of the Navy and the Army. Whatever the future may show that the Air Force is capable of doing in its independent capacity, it cannot be doubted that it will always be called upon to work in close and intimate co-operation with the Navy and Army. No commander who has once experienced the advantage of seeing "what is the other side of the hill" is likely to forgo it.

But the other Services cannot make the best use of the Royal Air Force unless they know its possibilities and limitations and understand the principles of its employment. Officers of the Navy and Army should know about the limitations of machines, for instance, the small amount of actual flying that can be done, at any rate continuously, in each 24 hours, and the reasons for this, namely, fatigue of pilots and the limitations of petrol capacity, due to the necessity for high performance.

The Need for Knowledge.

Naval and military commanders must realise this and the consequent necessity for making the best use of aircraft while they are in the air, and study its effect upon themselves and their tactics.

In the case of the Army, some of the effects are plain. Movements will have to be carried out by night to a much greater extent than in the past. In camps and billets comfort will often have to be sacrificed to security from aerial observation. Camouflage and smoke will have to be extensively employed. There is no better way, in fact it might almost be said that there is no real way, of learning all this except by personal experience.

The officers who are seconded under this scheme now will, I hope, be the Naval and Military Commanders of the future.

The Royal Air Force could, if necessary, be officered in other ways, but the seconding scheme is essential from the point of view of the other Services.

To return for a moment to the Short Service scheme, this is admittedly an experiment. Doubts have been expressed as to whether it will prove attractive, but I would like to put two questions.

Rightly administered on broad-minded and sensible lines, is it not possible that four years' service in the Royal Air Force, between the ages of 19 and 24, might prove, in many cases, a substitute to those who cannot afford a University career? Again, is the latter age really too great to permit of entrance upon another career, taking into consideration that they will have gained some experience of handling men, the widened outlook which results from travel and a modicum at least of technical knowledge?

Civil Service via Fighting Service.

Distribution affects very considerably the organisation of the Service, and I said just now that our problem is to meet present needs while keeping in view future requirements. Present needs are difficult to estimate in view of the almost universal unrest which causes the storm centre to shift almost day by day.

This inevitably makes for dispersion, which means inefficiency. In every case of military force, the evil of small detachments is recognised, but the material assistance that can be provided by small aerial units, together with the moral support they can render, is apt to obscure the fact that in an air force the inefficiency of small detachments is out of all proportion to their decrease in size.

This is, of course, because the Air Force, being a highly technical Service, is dependent on adequate workshop facilities, good provision of spare parts and other technical supplies, and efficient supervision by the higher ranks.

Air Commodore Brooke-Popham said in France, "An Infantryman can still fight if he is deficient of his great-coat or his water bottle, but the loss of one nut or bolt can render an aeroplane useless and an encumbrance on the ground." Yet people think a squadron hundreds of miles from a rail base can remain efficient.

The idea, therefore, is to concentrate in as few centres as possible, with power to move a suitable force quickly to any point required. The latter condition is the most difficult one to fulfil under present conditions.

Movement by air is complicated for us by the fact that to get anywhere from the United Kingdom we must pass over one or more European countries where we cannot establish the necessary ground organisation. And the route between Egypt and India cannot be used at present owing to Arab unrest.

Movement by sea is a slow business, unless aeroplane carriers are available, which is not the case at present. Shipping is difficult to obtain, and this is not to be wondered at when the bulk and weight of a squadron and its stores are remembered. A D.H.9a Squadron, for instance, requires 383 cases of various sizes, the twelve largest being over 27 ft. long, weighing 2½ tons each, measuring 37½ shipping tons each, and requiring specially large hatches.

In spite of many difficulties we have attempted to adhere to the principle of concentration, at present, I fear, not too effectually, but it is a principle which must be looked upon as fixed and must be striven for. One cannot look at a map of the world without seeing that Egypt is the centre of it from a Service aviation point of view. It is also an ideal flying climate.

Basic Principles.

When we come to consider the employment of the Royal Air Force, the first want we feel is that there is but little literature on the subject. There is no Royal Air Force Clausewitz or even a Hamley or a Mahan, and we cannot learn entirely from naval and military history.

I want here to emphasise that although there is no Clausewitz or Hamley or Mahan for the Royal Air Force, it must not be thought that there are no principles of tactics or strategy for the Air. The principles are there. Principles are not opinions but facts, and are unchangeable through all the changing types of machines of war.

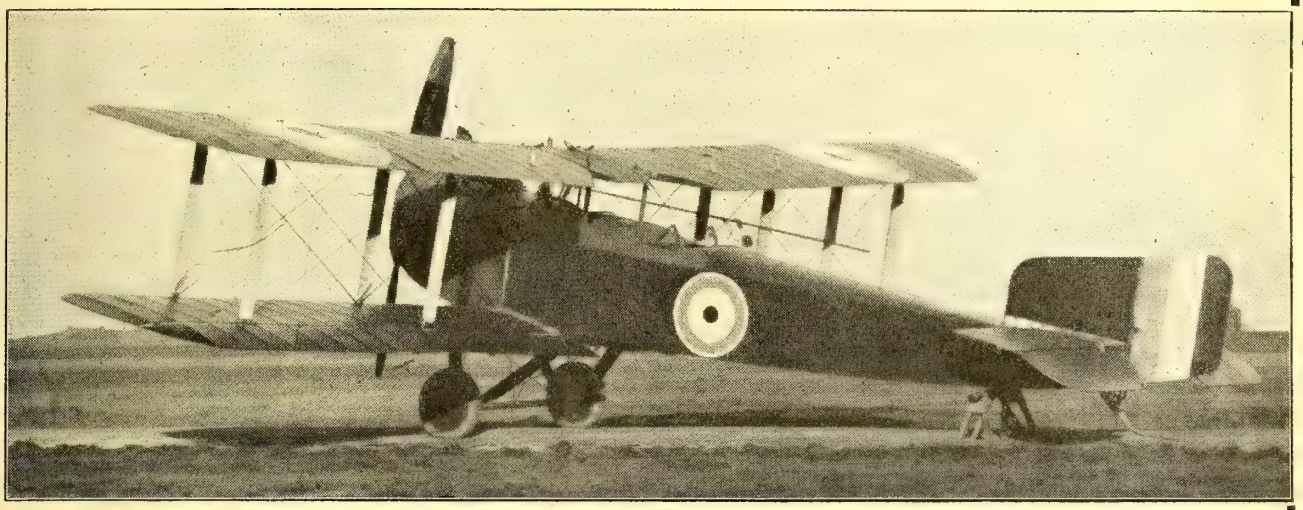
But what is the trouble? It is that these principles have not been formulated by a Hamley or Mahan and that they have not been accepted by the outside world. But the principles found in the last years of the war were found in the same way as they were found in the past. They were not created. Facts made them, and they exist and are sound, if only we had a Hamley or a Mahan to express them to the outside world.

But at the same time the coming of the Air Service means that the application of the old principles of warfare must be carefully studied to see in what way the application of the principles should be modified. Only think what an effect the introduction of the submarine, making use of the third dimension to a very limited extent, has had on naval warfare.

Time and space problems in aviation differ entirely from those which confront the naval or military commander. The moral factor is enormously enhanced in comparison with the material. There are no physical obstacles.

(*Continued on page* 713.)

Another Manifestation.



N.10.—The original "Type III." Fairey Seaplane—fitted by the Royal Naval Air Service with a shoregoing undercarriage for experiments in "deck-flying" in 1917. This same machine, with the same wings and the same tail-unit, but with a Napier engine and an amphibian undercarriage, competed in the Amphibian Class in the Air Ministry Competition in September, 1920, and put up a performance equal to that of the most modern flying-boats.

THE HISTORY OF A SEAPLANE.

She was designed in 1916; She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet early in 1919; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact and under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness as a Seaplane in the Summer of 1920; She has survived Nine Different Engines. In September, 1920, She competed in the Air Ministry Competition for Amphibian Aeroplanes.

In all this work no Single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Unit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

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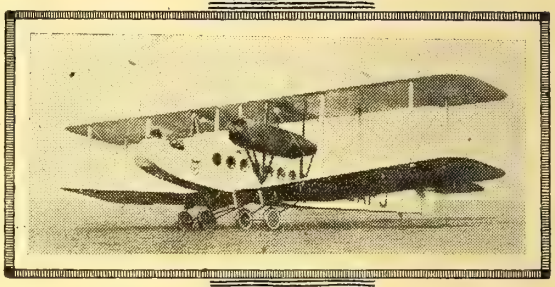

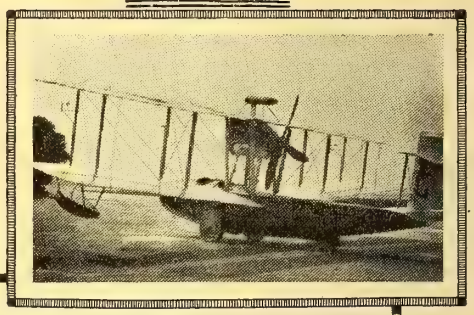

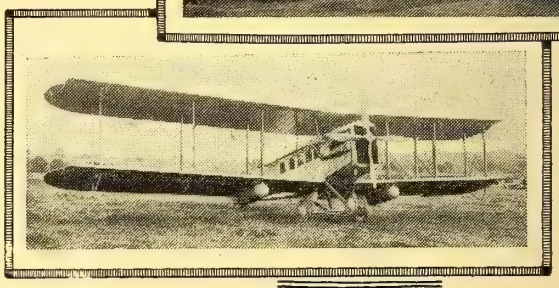

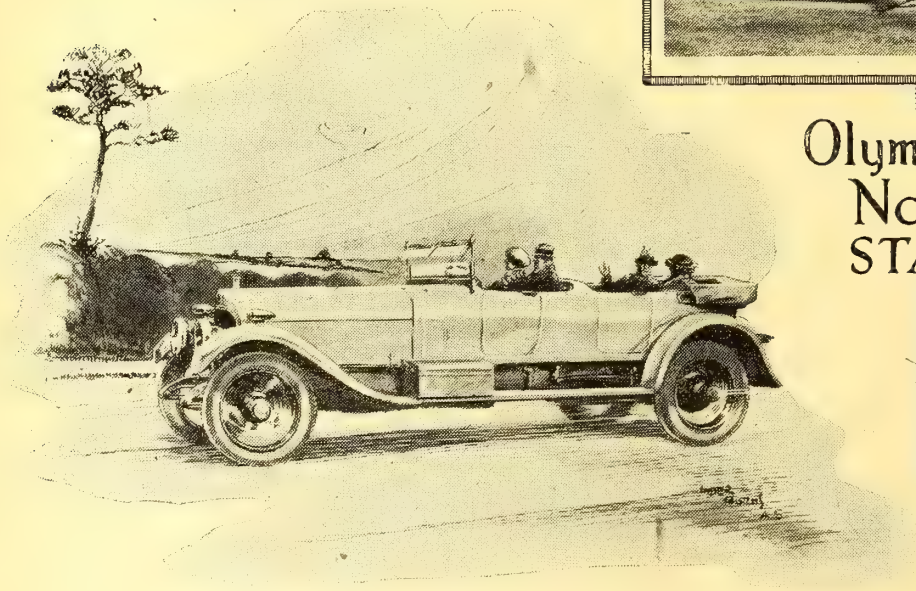

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THE WEEKLY COMMENTARY.

In this week's issue is published for the first time in any language a full and proper description of the Handley Page Wing, and a possible explanation of what the air does in connection with it.

Capt. Sayers discusses at some length the behaviour of the air round an aerofoil at its critical angle—or "burble-point"—and offers an explanation of the behaviour of the Handley Page wing in postponing the occurrence of this annoying phenomenon.

Despite the author's warning that his explanation of the phenomena with which the article deals is to be considered merely as a tentative working hypothesis, it is believed that the article will serve to give to many readers a much clearer idea of how an aeroplane wing actually acts on the air than any previous writings on the subject.

The very interesting paper on the technical aspects of aviation, read by Captain Barnwell at the recent Air Conference, and the discussion thereon, are reported in abstract on page 706.

BURBLING, AND THE HANDLEY PAGE WING.

By CAPT. W. H. SAYERS.

There can now be very few among those who are intelligently interested in the art of aviation who have not heard of the critical angle—or "burble point"—of an aerofoil, and who do not know that it is the existence of this critical angle which gives a limit to the slow speed of an aeroplane, and determines what is usually known as its "stalling point."

But although the burble point is fairly well known by name, and although most pilots have a very close acquaintance with what happens to an aeroplane when the burble point of its particular wing is reached, very little else is generally known on the subject.

At the present moment a rather peculiar interest attaches to this very important effect, because Mr. Handley Page, in his new wing, has in effect succeeded in avoiding the occurrence of a burble point—or at least in postponing it. And, obviously, it is difficult to form any clear idea of how this has been done unless something is known as to what actually happens when an aerofoil "burbles."

Now in attempting to form an idea of the mechanism of burbling it is necessary to recollect that really very little is known on the subject of the action of an aerofoil on the air, and that the attempt to predict the actual motion of a fluid in passing an obstacle, or to account accurately for the motions which have actually been observed under these conditions, has so far baffled the mathematician and the scientist.

Therefore, any attempt in simple terms to explain what happens when an aerofoil stalls, and why it stalls, must necessarily be taken as being no more than a tentative working hypothesis whose validity rests entirely upon the extent to which it succeeds in giving a clear mental picture of the facts.

WHAT IS BURBLING?

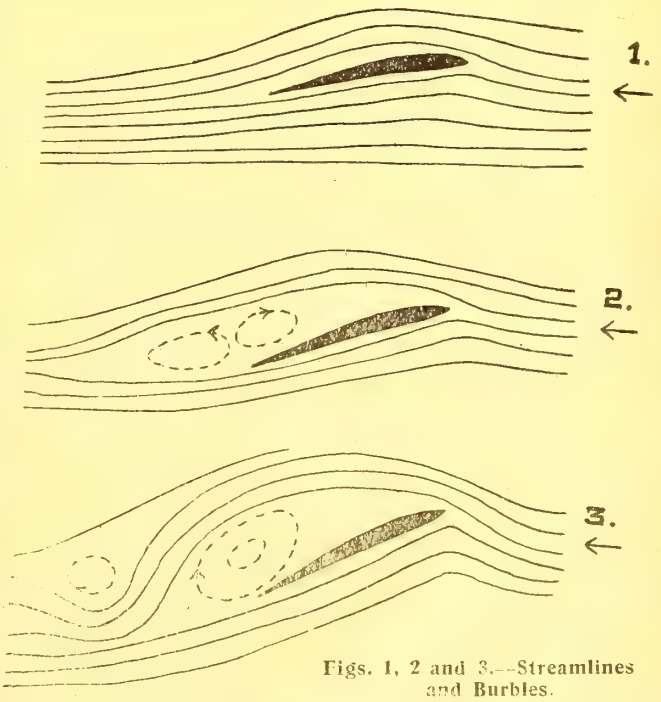
Returning now to burbling, Figs. 1, 2, 3, show roughly the kind of path followed by the air streams passing an aerofoil of normal type at three different angles of incidence. These sketches are based on actual photographs of such aerofoils.

Fig. 1 shows such an aerofoil at an angle within the ordinary range of flying angles, and the points to be noted are that the streamlines are deflected upwards before they reach the leading edge, that thereafter they follow fairly closely the contour of the aerofoil, and that beyond the trailing edge they have a marked downward slope. All these phenomena can be traced for an appreciable distance above and below the aerofoil.

In Fig. 2 the angle of incidence is greater, and burbling has just set in. The upward inclination of the streamlines ahead of the leading edge has become more acute, and on the upper surface they have failed to follow the contour of the aerofoil, even approximately.

At first sight this would appear to suggest that there is a marked reduction of pressure above the aerofoil, and consequently a considerably increased lift, but this is not the case. The space between the first streamline and the surface of the aerofoil is not in any sense a vacuum, it is a space filled with air in motion, but a motion entirely distinct from that of the steady flow past the aerofoil of the main body of air, and the effect of these eddies is apparently to push the air stream upwards away from the aerofoil itself. In this case they must equally tend to push the aerofoil downwards from the streamlines, and there can therefore only be a reduced lift caused by their presence. Incidentally, they also represent a marked addition to the drag of the aerofoil.

In Fig. 3 the angle of incidence is still greater, the rise in the streamlines ahead of the leading edge is still more marked, and the violence of the disturbances above and behind the aerofoil are even more intense. There is no pretence at a steady downward flow on the part of the air behind the wing, but a general condition of turbulence, with a great



Figs. 1, 2 and 3.—Streamlines and Burbles.

increase in the drag of the aerofoil, unattended by any commensurate lift.

Now, obviously this tendency on the part of the streamlines to leave the upper surface of the aerofoil shortly behind the leading edge, thus permitting the formation of eddies in the space between themselves and the aerofoil, is the essential feature of burbling, and it is equally obvious that the effect is the result of the inertia of the air. Just ahead of the leading edge of the plane this air is accelerated upwards, shortly afterwards it is accelerated downwards, and there is some limit to the acceleration which can be imposed on it by the action of the aerofoil. If the acceleration necessary to force it to follow the contour is below this limit, it follows the contour as in Fig. 1. If the acceleration necessary exceeds that limit, the stream lines diverge from the aerofoil contour as in Figs. 2 and 3.

The Up-current Ahead of the Wing.

Now the acceleration necessary to force the air to follow the aerofoil surface is obviously increased by the presence of the up current ahead of the aerofoil, and this up current becomes more and more marked as the angle of incidence of the aerofoil increases. If this up current can be reduced, something has been done towards postponing the "burble point."

It is therefore worth while to consider why this up current exists. In Fig. 4 there is shown roughly the distribution of pressure round a wing section. The little vertical arrows in the closed figures above and below the wing section itself represent the vertical air pressures to which the wing itself is subject. There is a relatively small upward pressure under the wing, and a relatively large upward "suction" on the top thereof.

Now if that distribution of pressure be imagined to exist round a stationary wing in still air, air would flow from below the wing to above it, round the leading and trailing edges, somewhat as indicated by the little curved arrows in the space between the wing and the pressure diagrams. This flow will be very marked round the leading edge, owing to the very great difference in pressure between upper and lower surfaces near that portion of the wing.

If now a horizontal stream of air be supposed to move from A towards the leading edge, it will be deflected upwards by the rising current round that edge, as indicated by the line of arrows.

With a steady stream of air past the whole wing, that stream itself producing the pressures which above were supposed to exist independently, although there will not be an actual stream of air from below the wing to above round the leading edge, there will still exist the forces tending to accelerate air in that direction, and it is these forces which produce the up current at the leading edge.

At the trailing edge there is a somewhat similar, but less marked, upward acceleration, shown by a reduction in the downward slope of the airstream leaving the aerofoil at that point in Fig. 1, and it seems highly probable that the eddies above the trailing edge, shown in Figs. 2 and 3, are kept in motion by air which actually flows up and forward from the under surface over the trailing edge.

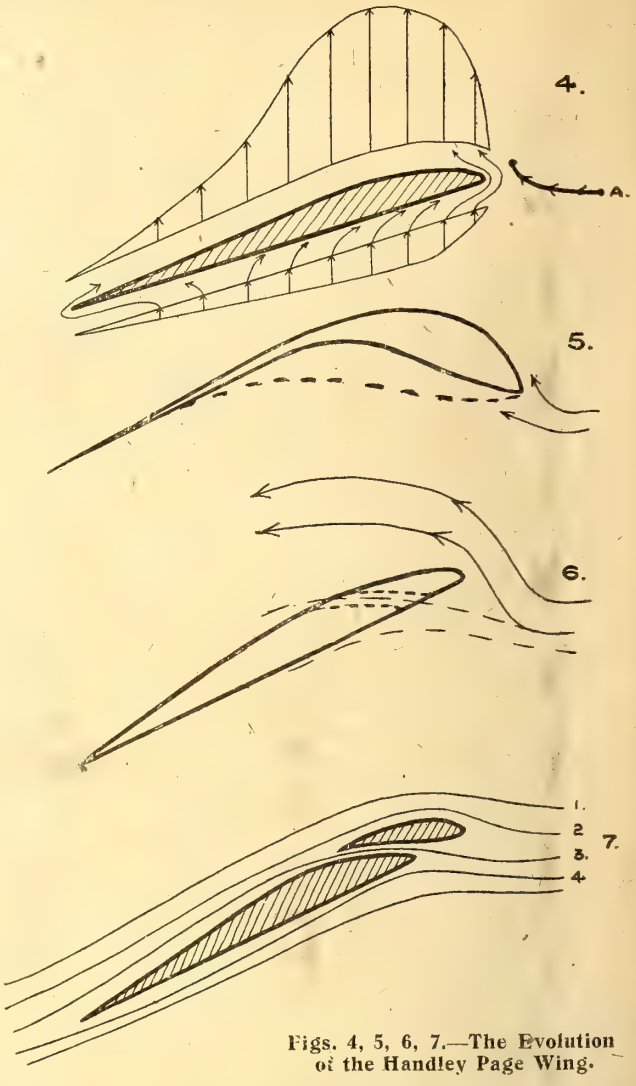
Deceiving the Air.

Among the very large number of aerofoil sections which have been tested in wind channels, the German establishment at Göttingen has tested a number of heavily cambered high-lift wings, which to some extent evade the burble point. These wings reach their maximum lift at somewhat similar angles to the usual English type of wing, but the lift does not suddenly fall after that angle is reached. It declines quite slowly, instead of falling off rapidly.

Practically all of these wings are characterised by an enormous "dip" of the front edge, being somewhat of the form shown in Fig. 5 in full lines. Here the path of two approaching air particles are indicated, one going above and one below the wing. But had the wing possessed the undersurface of the dotted line, it seems possible that that lower streamline would have been forced to pass upwards over the leading edge, would have crowded the upper streamline into an even more inclined path, and have produced the missing "burble."

In fact, the very marked upward trend of the lower surface at the leading edge may be assumed to have deceived the lower streamline into believing that it was on the road to pass over the wing, when in fact it was to be trapped by the under surface.

Fig. 6 represents again a normal aerofoil at an agle of incidence above "burble point," and part of two streamlines deflected up at a very steep angle. Consider the effect of cutting a slot through that aerofoil, as shown by the dotted lines. Reconsider it in the light of Fig. 4. Under the still air conditions supposed in Fig. 4 there would be a tendency for air to flow from below to above the wing through that slot, and this flow would greatly reduce the violence of the up current round the leading edge. From which it may be argued fairly that in the actual aerofoil, the upward deflection of the streamlines at the leading edge will be greatly reduced, and that, instead of following the full lines of Fig. 6, these two streamlines might follow some such path as is indicated by the dotted lines.



Figs. 4, 5, 6, 7.—The Evolution of the Handley Page Wing.

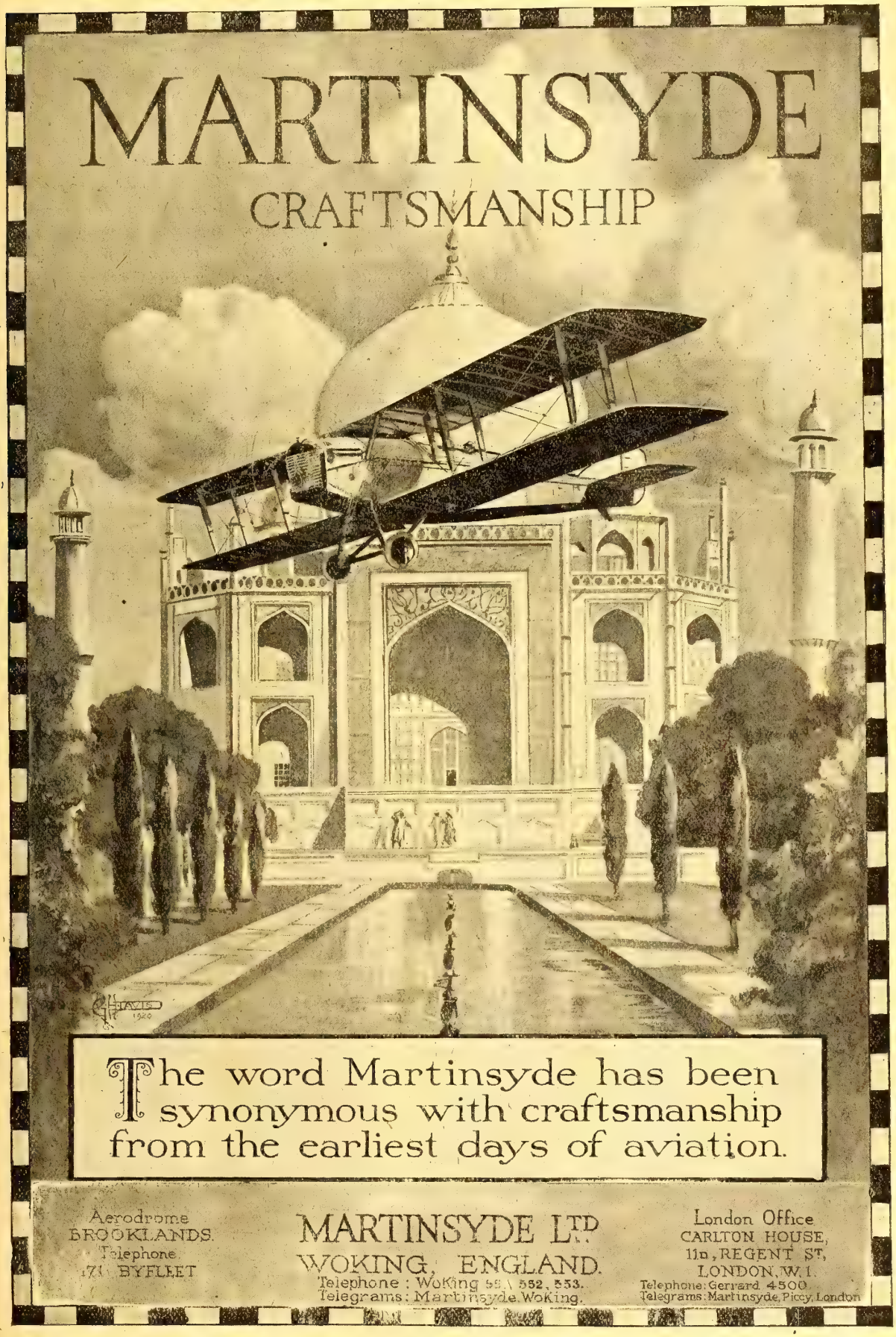
The Handley Page Wing.

Now Fig. 6, with the slot shown by the dotted lines, may be compared with Fig. 7, which is the Handley Page wing in its simplest form. An aerofoil of normal type is fitted with such a slot as was indicated in Fig. 7, and this slot is so shaped that both the detached leading edge and the main portion of the wing remaining are still of a fair aerofoil shape, while the gap between the two portions has a Venturi tube form.

When such a wing is tested in a wind tunnel it has been found that it behaves very much as it would do were the slot closed, except in two respects. In the modified form at fine angles of incidence its lift is a little less and its drag is a little greater than is the normal wing of the same overall form. But at what would be the burble point if the slot were closed, burbling does not occur.

Instead, the lift goes on increasing with increased angle without any enormous increase in drag. Eventually a burble point is reached, but this occurs at a value of the lift of somewhere between 40 per cent. and 50 per cent. greater than that of the unmodified aerofoil.

What apparently happens is shown by the streamlines marked on Fig. 7. The streamline marked 3 in the figure has done what it was supposed the upper streamline of Fig. 6 would be likely to do in the event of the slot being opened. Instead of being violently bent upwards over the leading edge it has passed nearly straight under the edge and through the slot. Streamlines 1 and 2, affected only by the relatively slight upward acceleration due directly to the leading edge —which is actually an aerofoil at an angle well below burble point—pass smoothly over its top surface, and combine with streamline No. 3 to form a steady flow parallel to the aerofoil top surface. Despite the fact that streamline 3 has escaped from under the leading part of the aerofoil, it has by no means escaped from the influence of the wing, but has been constrained by the effect of the aerofoil as a whole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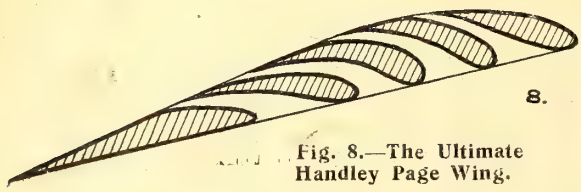

Fig. 8.—The Ultimate Handley Page Wing.

become part of a steady stream upon which a downward velocity has been imposed.

Now the effective lift of any aerofoil is due to the fact that it imparts a downward acceleration to a certain mass of air, and that the actual amount of the acceleration and the total mass of air subject to that acceleration is a measure of the lift.

The detached leading edge of Fig. 7 increases the value of the lift of the whole aerofoil system, at angles greater than those at which burbling would occur without it, because it acts in some sense as a guide to the entering air, and allows it to flow smoothly round the system instead of "bouncing off" as it does in Fig. 3.

Eventually an angle is reached at which the pressure release afforded by the slot no longer suffices to prevent a violent upward deflection ahead of the leading edge, and burbling again occurs. This effect can be staved off by providing further similar slots, and the process has successfully been carried to the extent indicated by Fig. 8, where the whole aerofoil has been converted into a series of detached surfaces.

At first glance it would appear that Fig. 8 represents merely a modification of the old and well-known multiplane arrangement, originally proposed by Horatio Phillips over 30 years ago, but although it is in some sense a multiplane, the action is quite definitely distinct from that of the multiplane as usually understood.

With the multiplane in its usual form there is a gap between the components which is large compared with the chord of those components, and the component planes are nearly vertically one above the other, and act nearly as independent aerofoils. At the burble point the mutual effect of two adjacent members, such as shown by Fig. 9, is probably that of a crowding up of the streamlines towards the rear of the chord under the upper member as at A, and a reduction in the amount of space occupied by eddies at B.

But despite the fact that there may be a tendency to force the streamlines at A to follow more nearly the upper surface of the lower wing than would be the case were the upper wing removed, the maximum lift and the burbling angle are not increased, except possibly to a very small extent, particularly with a heavy forward stagger. Fig. 10 gives an idea of why the lift of the multiplane is not increased despite the tendency to force the streamlines between the planes to conform more closely to the wing contours.

The Multiplane Fallacy.

The effect of the upward trend of the streamlines before each leading edge will be to tend to aggravate the upward trend of the streamlines approaching the leading edge above it, and this effect may be—and probably, with any practical gap/chord ratio, is—cumulative, and thus streamlines which would pass below the upper component of the multiplane, were it an isolated wing, are deflected above it, and although they may afterwards deflect downwards again, the lift which accompanies this downward deflection is offset by the force which has necessarily been exerted by the whole aerofoil system in giving to these streamlines their initial upward deflection.

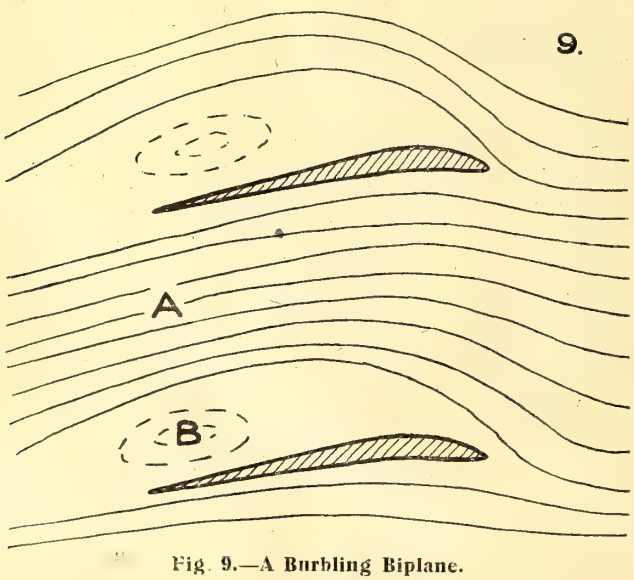

Fig. 9.—A Burbling Biplane.

Or, as an alternative simpler but less exact explanation, it may be considered that the up trend of the current ahead of the multiplane serves to deflect a certain proportion of the air out of the useful sphere of influence of the system, and thus reduces the total mass of air deflected downwards.

The slight improvement in the aerodynamic efficiency of biplane and triplane wings produced by a forward stagger may perhaps be accounted for by the fact that the upper and forward planes act to some extent as a H.P. leading edge for the wings behind and below, but it seems obvious that such an effect can only be slight unless the stagger angle is extremely great and the gap/chord ratio extremely small.

This latter condition is fatal to the efficiency of the multiplane if it be considered merely as an arrangement of a series of independent aerofoils, so that it seems justifiable to assert that the Handley Page Wing is not merely a modified multiplane arrangement.

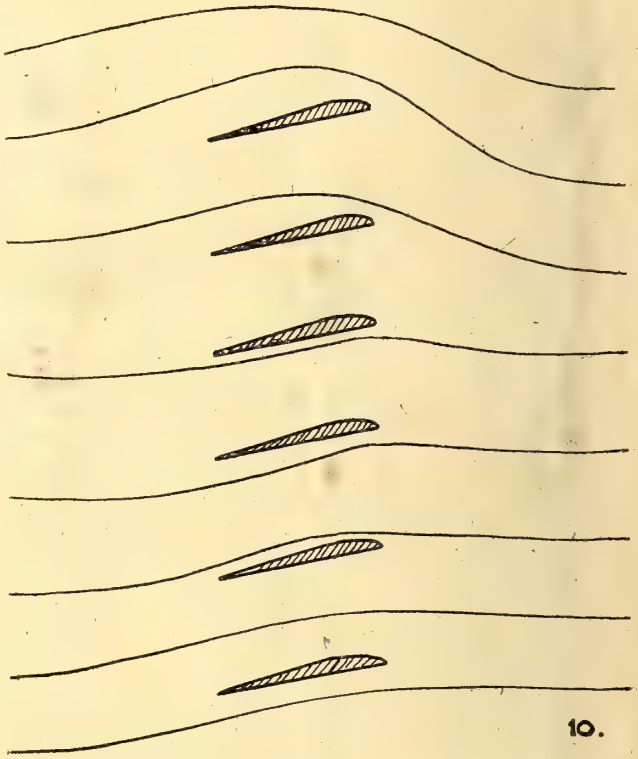

Fig. 10.—Why a Multiplane Loses Lift.

The Turbine Analogy.

The nearest analogy to the difference between the H.P. wing and the normal aerofoil is probably afforded by the steam turbine. In the turbine, a jet of steam moving at a high velocity impinges on wheels fitted with blades—incidentally, blades of a section very like to an aerofoil—and is by those blades deflected from its initial path. The reaction on the blades, due to this deflection of the steam, drives the turbine blades in a direction opposite to that of the motion impressed by them on the steam.

The force on the blades increases—as in the case of the aerofoil—with the velocity of the stream past them, and with the angle through which the stream is deflected.

In order to obtain a turbine capable of giving a large torque at a reasonable peripheral speed of the turbine wheels a very great deflection of the steam stream is necessary, and any attempt to give it this large deflection by the use of a single row of blades leads to results similar to those attending the attempt to obtain a high lift from an aerofoil by giving it a very great angle of incidence.

Consequently in turbines of any but the smallest sizes, where very high speeds on the turbine can be handled by gearing, a whole series of turbine wheels in tandem are used, and each of them deflects the steam through only quite a small angle. The sum of all the deflections over the whole turbine thus becomes very much greater than could possibly be achieved by one set of blades. Burbling—exactly similar to that of an aerofoil at its critical angle—would have set in before such a total deflection could be reached in the single stage.

It is therefore not inapt to compare the relation between the H.P. wing and the normal aerofoil to that obtaining be-

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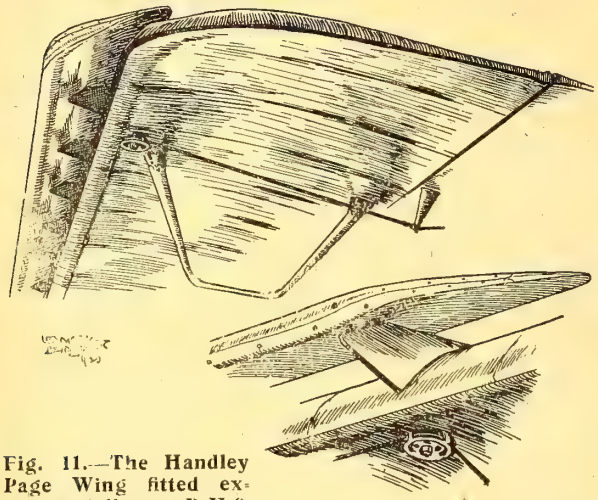

Fig. 11.—The Handley Page Wing fitted experimentally to a D.H.9

tween the multiple stage and the single stage types of steam turbine, and to suggest that what the H.P. wing does is in a series of gentle steps to coax the air flowing past it into a downward path, which it would be impossible to force it into in one single step.

THE PRACTICAL APPLICATION.

Fig. 11 shows the method of adapting to the wings of a D.H.9 the single slot type of Handley Page wing. The original nose ribs have been replaced by shortened ribs, and at intervals a number of elongated solid ribs project ahead of them through the ordinary fabric cover.

These projecting ribs carry a tubular steel spar upon which is built up the leading guide edge—really a rather thick, heavily cambered small chord aerofoil set at a negative angle relatively to the chord of the plane proper.

A DEMONSTRATION.

The machine so fitted was publicly demonstrated at the Handley Page Aerodrome at Cricklewood on the afternoon of Oct. 21st, and for comparison a D.H.9 exactly similar, except for the fact that the latter had normal wings, was flown alongside so to speak. It was perfectly obvious—particularly to those who know the habits of D.H 9s—that the machine with the modified wings got off at a much lower speed and with a shorter run than was possible with the standard machine.

It took nearly as long in time, but much less in space for this purpose, and once off the ground it proceeded to climb at an extraordinarily steep angle. Here again the H.P. wing apparently took as long a time to reach a given height as standard, but it was climbing fast with a very low forward speed.

It also showed that it could remain in the air, with the engine throttled down, at very low speeds and at a frightening angle of incidence.

Major Foot flew the machine for the first time, and so naturally did not make such a display as he would have done with more experience, though in fact his inexperience of this wing made the test all the more convincing to those who knew.

With its tail hanging down in a way which, with wing, would certainly have resulted in a stall, Major Foot turned and manœuvred the machine with certainty and precision, and with the engine off it descended on a very steep path at a very low speed, and with its tail well down.

In landing it was brought down to close to the ground in what looked like an enormous "pancake," but was actually a steep glide at a low speed, and then showed, by dropping its tail appreciably and flattening out, that it was still some considerable way from stalling.

Merely from an observation of the flights it is impossible to form any opinion of the actual aerodynamic qualities of the wing in question, but it was perfectly obvious that the machine was flyable at angles of incidence at which a normal wing would have been burbling wildly, and the machine fitted therewith entirely out of control.

At present the wing has only been tested on an actual aeroplane as a fixed affair, and the result is that on any given machine the top speed is somewhat reduced owing to the increased drag of the wing at fine angles. But it is fairly obvious that there is no insuperable difficulty in retracting the nose piece to fit snugly against the remaining part of the wing, so that at high speeds a normal aerofoil can be used, or in moving it clear for landing and getting off.

[One gathers that this particular machine has been flown by Mr. Hill off the deck of H.M. Aircraft Carrier *Eagle* with marked success. Its get-off took a much shorter distance than does any normal machine of similar weight for power. Certain critics of the performance seem to be somewhat inclined to ignore the fact that the machine used was not designed for the new wing and that the wing used is itself only part of the full development.—Ed.]

CAPT. BARNWELL ON THE TECHNICAL ASPECTS OF AVIATION.

The paper read by Capt. F. H. Barnwell before the Air Conference on the afternoon of Oct. 13th may best be described as a frank expression of the large element of doubt which still occupies the mind of the competent aeroplane designer, combined with a plea for the clearing up of some of these doubts by those charged with the control of research facilities.

The criticism passed on Capt. Barnwell's request for wind-tunnel research on wings and combinations thereof by Mr. J. D. North, that the programme involved about one million combinations and permutations to be tested, and would take one wind-tunnel 3,000 years to execute, coupled with Dr. Bairstowe's assent, and the latter's statement that it was now time to drop the trial and error method of testing and analyse the results already attained with a view to reaching an ordered knowledge by which results could be accurately predicted, is of distinct importance.

Firstly, it shows how very little real progress in knowledge can be gained by piecemeal experimentation; and, secondly, that those in charge of the research establishments realise how wasteful of time and effort were the methods imposed on them by war conditions.

Mr. Bairstowe's claim that he thought that in the light of the present state of knowledge it was possible by calculation to predict the performance of any wing or wing combination, tapered, twisted or warped, with fair accuracy, is distinctly interesting. He failed to make it quite clear whether he referred merely to methods of extrapolating from experimental results already in existence, or to the development of some theory of the mechanics of fluid flow which claims to allow of reasonably accurate direct calculation from first principles.

But although the wind-channel authorities may be fully justified in their claim that it is impossible to carry out the series of tests asked for by Capt. Barnwell by direct experiment, it is distinctly their business to find some way of supplying him with reasonably accurate information upon all the points whereon he desires information. At the present moment the aeroplane designer is far from possessing such information even in regard to the qualities of full-size enlargements of many wind-channel models which have been tested almost to excess.

Mr. Bairstowe's further remarks as to the importance of stability and control investigations are also important

For very large machines he is undoubtedly correct in saying that the difficulties involved under these headings are at least as important as the questions of performance, and his claim that, once the research worker had formulated a clear and satisfactory theory of such a subject as stability, the matter then passed from his hands and that it was the designer's business to apply that theory to practice, has elements of justice.

But the aeroplane designer of to-day—if he is to be successful—requires fairly extensive qualifications. His capacities must include an ability to solve the simpler aerodynamic problems involved in the effort to secure performance, the mechanical ones of structure design, and the practical engineering and commercial knowledge required to secure that the machines he designs are practical commercial propositions both to build and to operate.

To demand in addition a knowledge of the type required to use the mathematical theory of stability in its present state in the ordinary routine of drawing-office work is to ask for the qualities of a superman. What is required is some intermediary between the scientific research worker and the designer—and in aeronautics he scarcely exists. If the Zaharoff Chair of Aeronautics successfully produces a number of these intermediaries, Sir Richard Glazebrook may possibly be forgiven.

AN ABSTRACT OF THE PAPER.

OVER-ALL DESIGN.

To consider firstly the best disposition of the various members of an aeroplane.

By the end of the war the single-engine tractor biplane had practically a monopoly, except for machines too large for a single engine (of the highest power made). For these one other type fairly established itself, the twin-engined tractor fuselage biplane.

Of these same two types are practically all aeroplanes used for civil flying up to date.

There are many well-known reasons for the predominance of these two types.

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Now that we have more time for careful investigation, before designing new machines, the first point to be considered is: Are there possibilities of obtaining better all-round machines by radical alteration of over-all design? It seems distinctly doubtful; and we cannot, for the present, hope to attain any great advantages by doing so, unless there are radical alterations in power plant. It appears reasonable to continue with the development of the single-engine tractor type for all machines up to the largest that will be satisfactory with the largest satisfactory engine. It is improbable, however, that the biplane is right for all sizes and purposes. For any type of wing structure it seems probable that, up to a certain limit of weight, a monoplane form is best; beyond this, and up to some other limit, a biplane form; beyond this again, a triplane form. It would appear also that structural improvements in wings will tend to raise these limits, and that for commercial machines (where rapid manœuvrability is of minor importance) they will be higher than for service machines (where rapid manœuvrability is of great importance).

The problem is suitable for mathematical analysis, and merits a considerable amount of work.

For machines too large for any single engine (assuming that it is proved economical to build such) it is doubtful whether engines mounted along the wings give the best solution. The weight saved by mass distribution is mostly lost again in increased weight required to resist stresses due to vibration and drag forces. For large machines, particularly of the flying boat type, it seems possible that a type with central engine room and geared twin airscrews offers the maximum desirable features. Another type worth consideration is the single tractor airscrew machine, with multiple engines geared to the single tractor.

As regards information which designers require with respect to over-all design:—Many experiments on models of different types of complete aeroplanes, with airscrews running; the models to be as large as possible, and the wind speed as high as possible; the drag forces on the models to be analysed.

Considerably more research on methods of determining the forces applied to, and the load factors requisite for, all parts of the structure. It cannot be said that our present methods are entirely competent to ensure the requisite strength and the minimum weight for all parts of the structure. Research is wanted on questions of weight and efficiency of gearing, the necessary clutches, etc., and on the gain in propeller efficiency and drag reduction for the gear-driven airscrew machine, as against the wing-engine machine.

Above all is wanted demand for new aeroplanes, with all requirements fully and accurately stated and strictly adhered to.

Turning to Detail Considerations.

Airscrews.—No great advance can be made in efficiency for any one set of conditions; under good conditions probably no more efficient thrust producer is possible, certainly at same weight. Durability must be considered together with first cost; metal is not necessarily better than wood on these considerations. Research work is required on suitable covering for wood blades, to resist abrasion of long grass, rain, etc. Metal propellers appear desirable, but must prove their superiority in service.

More experiments might be made on the sword-blade type of multi-blade screw. For further development, the first step is the production of an airscrew whose pitch is variable simply and accurately on the ground; this is practically accomplished. The next step is the production of one whose pitch is variable in flight.

The ideal to be aimed for is an airscrew whose pitch and diameter may be varied in flight.

Engines.

The future of aeroplanes depends largely on engine development.

Assuming that the reciprocating type of internal combustion engine is, on the whole, the best method of converting the heat energy of fuel into rotative power, we must aim at using heavier fuel than petrol. The development of paraffin carburetters seems highly desirable.

Should it be possible to dispense with electrical ignition, even if only after starting up, this would be a great step towards reliability, especially as this would probably involve direct injection of fuel and scrapping of carburetters.

Really sound reduction gears between crankshaft and airscrew shaft are almost essential for commercial aeroplanes. All engines should be designed with these, and with provision for varying the gear ratio as simply as possible. It is also desirable that the length of nose be made greater than present practice.

Air-cooled engines must be developed. Radials, essentially light per horse-power, seem correct for service machines; but the development of "line" cylinder air-cooled engines, say, 6-cylinder single row and 12-cylinder Vee, seems highly desirable for commercial work.

Is it not possible to produce satisfactory inverted engines, vertical or Vee? The advantages, for single-engine tractor machines, would be enormous.

There seem possibilities also in the two-stroke engine for aeroplanes, provided it can be kept of the simple transfer port type.

Wings.

Probably the best means of comparing wing forms is by a curve of L/D on a base of lift co-efficient, the base being laid out as fractions of maximum lift co-efficient. From such a curve one can see at once which wing form will give the minimum drag, at any particular multiple of stalling speed.

We probably have sufficient model data on aerofoils of rectangular plan form and constant section. We require data on aerofoils of tapering section, tapering plan form, tapering plan form and section. Unfortunately, this gives such an enormous field that it will be hard to decide the best systems to work on. There seem distinct possibilities of improvement in performance and structure in the employment of cantilever wings, of thick section at point of support, tapering in thickness towards the tip, this particularly in conjunction with metal wing spars.

Full scale experiment on wing forms is essential at present, simultaneously with wind tunnel work. Sooner or later we should be able to do practically all experimental work in the wind channel.

As regards structure of wings, there seems to be a general opinion that wings will be perfect when made entirely of metal, and only then. This may be so, but it is open to doubt, and there seems no purpose in decrying wood and fabric because they are wood and fabric; both are very excellent structural materials. Research is required into protective covering for wood, particularly with respect to preventing its "drying-out." Research is required also into protective covering for metal; it is possible that the difficulties are as great as for wood.

A decided superiority of metal over wood is cheapness and soundness of production in very large quantities; and it is mainly because I trust and believe that aeroplanes will eventually be built in very large quantities that I advocate metal construction. For the present I should advocate metal spars, ribs, edges, etc., but fabric covering. With the highest wing loading practicable at present fabric is quite a sufficiently strong material, and it is not yet proved that its durability compares very unfavourably with that of very thin sheet metal. Metallic covering must be heavier than fabric, and unless the metallic covering constitutes as well the strength members of the wing, in fact *is* the wing, the weight will be prohibitive. The strength of a metallic shell of wing form is practically impossible to calculate; it must be found by experiment. Certainly it appears well worth while constructing and testing metallic shell wings, but it will be expensive work.

Bodies.

The question of body structure is much the same as that of wings, with the difference that fabric is a less suitable material for covering bodies than wings.

Research is wanted on the question of suitable covering material, light, stiff, durable, oil-proof, etc.

At present the soundest form of body is probably a girder built up of steel tube longitudinals and struts and steel wire tie-rods, and covered with a suitable material.

The monocoque form of body looks very pretty (if well made), and partly because of this (I think) has many advocates. But it must be considered fairly on its merits. It, again, is a structure whose strength and, therefore, ultimate detail design, must be determined largely by experiment. It seems highly desirable that a series of comparative tests of monocoque bodies (both of metal and of plywood), girder bodies of metal, and girder bodies of wood and steel tie-rods be carried out.

Alighting Gear.

This is probably the worst designed part of a normal aeroplane. It is a nuisance aerodynamically, and perhaps this may explain a certain lack of attention.

The life of an aeroplane depends largely on a good undercarriage.

It seems certain, in future, undercarriages must be designed with long range of shock-absorber travel, with oleo dashpots, with large wheels and tyres, with efficient brakes. This last requirement calls for front wheels; these may either be designed as secondary organs (only coming into action to prevent somersault) or as definitely taking part of the load all the time. The latter appears the more logical procedure.

The brakes should be capable of independent operation for steering on the ground, thereby dispensing with the so-called steerable tail skid, which is, on the whole, unsound.

After achieving an undercarriage with really good ground work qualities comes the reduction of its drag in flight. Suitable fairing around tandem wheels and of the other members may be found sufficient for machines of medium speed; but, probably, for long range fast machines some form of folding gear will be evolved. Drawing the whole undercarriage up into the body is impracticable, as it takes up much space in

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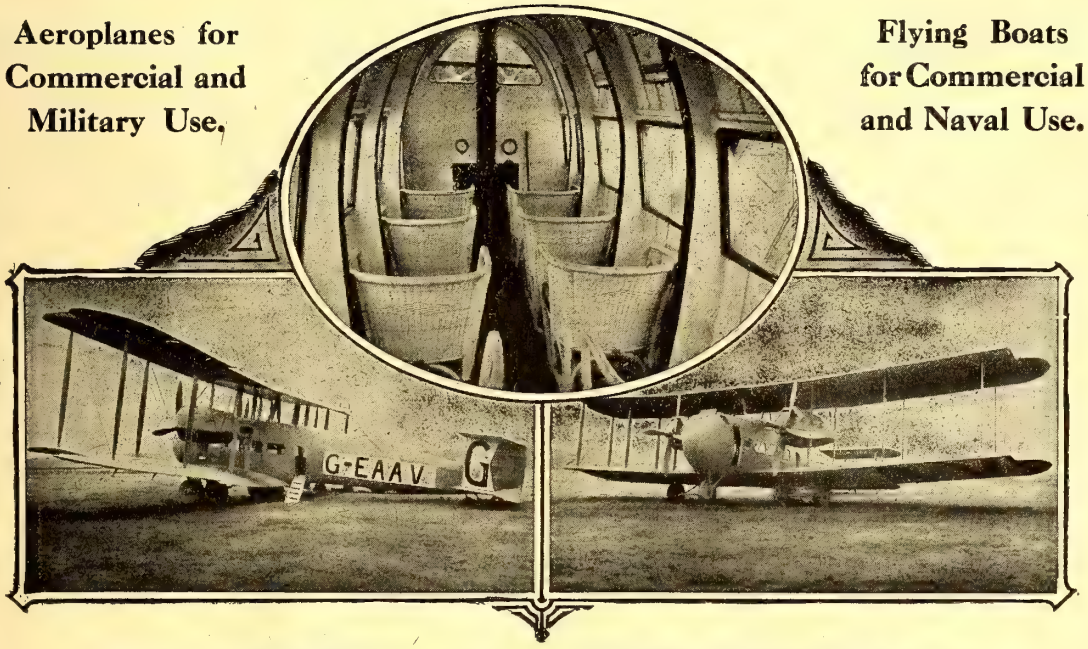

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the most useful part of the body. The most promising idea appears to be that of folding the undercarriage out and up against the under surface of the wing, suitable recesses in and (or) fairings on the wing being provided for its accommodation.

A considerable amount of research is wanted on undercarriages.

Wind tunnel experiments on different forms, and varied fairings of each form; tests on oleo dashpots; tests on air dashpots; the practicability of manufacturing springs of *tubular* steel, and tests on same; the practicability of solid tyred wheels. The instructions, as at present drawn up, for stressing undercarriages are not entirely satisfactory, and should be reconsidered.

Fuel Systems.

Accurate and fool-proof gauges, easy to install at a distance from the tank, suitable for either pressure or non-pressure tanks, are very badly needed. Sound metallic joints for fuel pipes must be evolved, and the use of mild steel piping suitably covered inside and outside seems well worth considering.

Controls, Surfaces and Actuating Gear.

A certain amount of additional research work is required on the efficiency of control surfaces, on the forces on them and caused by them, and, particularly, on the balancing of them.

It seems possible that some form of electrical or hydraulic transmission between controls and control surfaces might be evolved, and be considerably easier to install than the present direct system of cables leading over many pulleys and guides.

THE DISCUSSION.

The discussion was opened by Air Commodore H. R. M. Brooke-Popham, the Director of Research, Air Ministry, who said that research in Civil Aviation must be directed to producing aeroplanes to pay. Reverting to a point raised in the discussion on the previous paper, the steam turbine might pay despite high fuel consumption, because it used cheaper fuel and the insurance rates would be lower. He thought that a tone of undue pessimism pervaded the aviation atmosphere, and he recalled as a corrective the atmosphere of Brooklands ten years ago. No one there then thought of dividends, but they were at least cheerful, and the work of those pioneers should never be forgotten. Progress could not be estimated in terms of the number of wind-channels or in the performances attained by machines.

He thought Britain was a little too self-complacent as to her position in aeroplane research and design. He pointed out that in regard to metal construction and to gear drives for engines Germany was ahead of us. Gear-driven German aeroplanes had dropped bombs very close to that place three years ago. We were just investigating the difficulties of gear-driven machines.

He was afraid of aeronautics getting surrounded by a ring fence. Actually, aeronautics touched on more branches of applied science and engineering than any other industry, and it was important that knowledge of the technical difficulties encountered in its developments were made as widely known as possible that all the assistance possible should be gained from other industries.

He thought it would be an excellent thing if some of the technical people who had been in the R.A.F. during the war and had now returned to other branches of technical work could put in a week at the R.A.E. or the N.P.L. every year. He meant at work with their coats off and getting dirty—not just looking round intelligently. They could afford real assistance in this way, because they would bring outside knowledge to bear on the problems and would take back to their own sphere a knowledge of the difficulties encountered.

Mr. J. D. North (of Boulton and Paul) made the objection to Capt. Barnwell's ambitious scheme of wind-channel research that it would occupy at least 3,000 wind-channel years to complete. Trial and error methods could not solve the problems involved, and the use of logic must be invoked. As to the subject of central engine-rooms and gear drives, he was inclined to think that the troubles encountered had inclined the Germans to abandon their efforts in this direction.

In the matter of unbraced wings, the word "cantilever" was assuming the position of a "blessed" one like Mesopotamia. After all, it was only putting bracing inside instead of outside the wing, and the wing bracing resistance was so small a fraction of the whole that thick wings would have to show greater efficiency than they were usually supposed to have to give any serious advantage.

In regard to metal coverings, he agreed with the lecturer: it could only be economical if it were used as structure.

Dr. Bairstowe said that, on the whole, he thought that the greatest field for improvement was presented by the engine problem. The airscrew, with its 80 per cent. efficiency, was probably as good as any and better than most other propulsive agencies. Improvement must develop along the present lines and not much in new departures.

The helicopter was possible, but not immediately promising. Flapping wings could easily be investigated aerodynamically, but any possible advantage was overshadowed by structural difficulties. Really quite a lot was known as to performance of aircraft, but little about stability and the allied problems of control. These two ignorances accounted more for the failure to produce satisfactory large aeroplanes than anything else.

Wind-channel tests, such as Capt. Barnwell asked for, were the result of the failure of the theory of fluid motion to give practical results, and were a form of trial and error method. If a bridge builder wanted to design a bridge he did not build a model and test it—he had theories which sufficed to design with reasonable safety.

The time had come to attempt to use similar theories in aviation, and research should now be devoted to linking up the results of tests already made. Progress was being made—instance the calculation of airscrew performance—and further extension was certain. He thought that the performance of any shape of wing, twisted or tapered, could now be predicted with fair accuracy.

The research work which had been done on stability was criticised as being presented in a form not directly useful to the designer, but he held that the work of research was finished when it had evolved and presented a clear working theory of the facts. It was the designer's job to make practical use of the theory.

Brig.-Gen. Bagnall-Wild, Director of Aeronautical Inspection, said that inspection duties gave great opportunities for criticism. He thought that for commercial purposes the question of spares was of great importance. Simplicity and the use of cheap materials were vital. He thought that for that reason the strap type of sheet-steel fitting should replace stamped or forged fittings.

As to fuel for civil work, he thought something beyond the paraffin carburettor was needed. The use of heavy oil and of alcohol must be considered. He thought it probable alcohol produced as a by-product in the Tropics might ultimately be available at the bare cost of transport from the place of production.

Maj.-Gen. Sir Sefton Brancker enlarged on the commercial importance of inherent stability. The most serious enemy of commercial air transport was fog and clouds. An unstable machine in fog or clouds was entirely dependent on the pilot's skill, and momentary failure of the pilot would result in a crash.

For commercial work they must have machines stable enough to fly through clouds with the use of rudder control alone. In fact, there seemed no reason why commercial aircraft should not normally be flown in this manner.

Another important matter was the provision of means for getting machines off the ground with heavy loads. This required a greater power than needed just to fly when the machine was in the air. Engine installation, with a view to facilitating overhaul and to securing reliability, required much more attention, and the air-cooled engine must be developed to get away from water-system troubles.

He wanted to protest against any spread of pessimism. Efficient air transport was possible and accomplished to-day, and although there were many lines open for improvement, he feared that the impression might spread that these desirable improvements were necessary preliminaries to the efficiency of such transport.

Mr. Robert Blackburn (The Blackburn Aeroplane & Motor Co., Ltd.) wanted to put a question in regard to aeroplanes somewhat similar to that asked by Mr. Chorlton in the morning regarding engines. Would the Air Transport people tell aeroplane designers definitely what class of aeroplane they really wanted? In all previous transport systems the mainstay of the business was merchandise—was the aeroplane to be an exception? Did they want slow-speed economical load-carriers or high-speed passenger and mail machines? He proposed that the Conference pass a resolution asking for a settlement of this question.

After a discussion on this point Mr. Blackburn agreed to withdraw the proposed resolution, it being pointed out that the Air Ministry could not decide such a point, and that the S.B.A.C. provided the means for designers and transport officials to exchange views on such subjects.

THE ZEPPELIN MONOPLANE.

According to the *Times* of Oct. 16th the four-engined all-metal Zeppelin monoplane which was described and illustrated in The Aeroplane of May 19th, 1920, is now nearly ready for trials. It is also stated that, following the trials, an attempt will be made to fly the Atlantic on this machine.

The account in the *Times* is headed "New German Secret Monoplane," and is in general of the usual order of journalistic picturesqueness.

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(*Continued from page 698.*)

The R.A.F. Staff College

We have, however, the experience of war in many theatres to guide us, although it has not yet been committed to paper in any readily accessible form. The need of a Royal Air Force Staff College to analyse principles and create a school of thought is obvious. This could not be done at the Navy or Army Colleges, where, with all the good will in the world, the problem would inevitably be approached with pre-conceived ideas.

In this connection I would like to emphasise once more the point I tried to make when discussing the provision of officers, namely, that the other Services must study and understand us, since whatever the future developments of the Royal Air Force in its independent capacity, it is certain to be constantly employed in co-operation with both the Navy and Army, and can only be used to the best advantage if studied and understood.

Operations and Co-operation.

In my opinion the most important principle of all, and the one perhaps least generally understood and appreciated, is that the work of the Air Service either on land or sea, in spite of its many and various aspects, can only achieve its greatest efficiency if regarded and carried out as a single co-ordinated effort.

The work required, whether by the Navy or Army, is both tactical and strategical. It consists of reconnaissance and photography, or spotting for the artillery and of offensive action against troops or ships, against personnel and material on lines of communication, depots and harbours.

Independently of this work in intimate co-operation with the other services, the Air Force can attack the enemy's sources of supply and the moral of his civil population and government. It is, however, utterly wrong and very wasteful to look upon these as entirely separate duties. In the first place, to perform any of them with success it is necessary to gain predominance in the air, and the air is all one element.

With regard to this predominance in the air, I would like to point out that in a first-class war one side will gain predominance in one place and may temporarily lose it in another theatre. And we must face the fact that the main point is to have the predominance in that area which at the time is considered of primary importance, if it is not possible to gain it in all areas.

Another fact that must be borne in mind is that the development of an aeroplane with greatly increased fighting capabilities may cause a temporary loss of the predominance in the air. And until the civil population and the Army consider that they have lost the war it is never safe to consider that one side has gained predominance in the air permanently.

To revert to the co-operation of what is essentially air work with that for the other Services, it may be that the normal duty of some squadrons may be artillery work, of others the attack of the enemy's fighting troops, and of others the distant bombing of his factories. But it is essentially wasteful to divide the Air Force up into separate bodies for each duty.

If, for instance, squadrons are only employed for long distance bombing, starting possibly from somewhere outside the army zone, their power is wasted when the weather is unsuitable, as it often must be. Again, there often comes a time when the artillery requires but few machines, and the artillery squadrons can profitably be employed in other work. In fact, all bombing, even when carried out on very distant and apparently independent objectives, must be co-ordinated with the efforts that are being made by the land and sea forces, both as to the selection of objectives and as to the time at which the attacks shall take place.

In my opinion, bombing, to be effective, must be continuous, and it is from the accumulative moral effect of attacks carried out day after day for a week or ten days in succession the best results may be expected. I may be wrong, but, in my opinion, the moral effect of bombing, especially night bombing, does not decrease with experience. I have often heard people say that although the moral effect of bombing may be very great for the first two or three times, people soon get used to it. Personally, I believe the reverse is the case.

I have not mentioned surprise, which is just as important in the air as on the ground, though harder to obtain. For one thing, the need for exerting constant pressure conflicts with surprise. But at the same time surprise can be used with great effect in the air owing to the power of being able to switch off from one point of attack on to another, very often with hardly any movement of aerodromes.

In this connection I must emphasise the point that I am certain was proved, but was, I agree, contested by some, namely, that aerodromes must, and will, be pushed close up to the enemy to get the maximum out of its power for most of its work. I agree that long range bombing can be carried out from further back, but I must emphasise the fact that in carrying it out from bases situated unnecessarily far away from the enemy's front, some of the power of the air will be lost.

There are, also, some negative principles, especially applicable to fighting on a smaller scale, in undeveloped and extensive countries, which appears the most probable form of warfare we are likely to see for the next few years.

The power of aircraft to cover great distances at high speed, their instant readiness for action, their independence of physical communications, their indifference to obstacles, and the inability of an enemy unprovided with an air service to counter their attack, combine to encourage their use more often than the occasion warrants. The power to go to war at will is apt, in fact, to result in a thoughtless application of that power.

This is particularly so in the case of small detachments at the disposal of relatively junior commanders. Over-precipitate action is not in itself perhaps a serious mistake. It is in its probable lack of results that the danger lies, by robbing the air service of that moral effect which is its chief asset.

Offensive action in the air to bring a stubborn enemy to task must be followed up, and this cannot be done if it is commenced with insufficient forethought and inadequate resources. The capacity of the Air Service to deal a swift and unexpected blow may indeed succeed in stifling an outbreak in the early stages. But it is in the power to continue offensive action day by day and, if necessary, week by week, that the assurance of ultimate success lies.

This brings my paper to an end, and I am afraid it has not been as illuminating as I should have liked. I have tried to cover most of the subject, but it is, I think, almost impossible to deal with the whole of it in one paper and to make it interesting and lucid

An Addendum

Sir Hugh Trenchard, in addition to the matter contained in his paper, as published hereinbefore, drew attention to the fact that air power is valuable in releasing troops on service in distant parts of the Empire, and also for diminishing the work of troops abroad by using aeroplanes in conjunction with them. He said that the war had shown that an Air Force had capacities which were entirely its own.

THE DISCUSSION.

The Naval View.

The Chairman, the Earl BEATTY, remarked that he was glad to know that the Air Service welcomed criticism. He did not offer any criticism himself, but merely called upon the first speaker.

Rear-Admiral Sir A. E. M. CHATFIELD, R.N., Deputy Chief of the Naval Staff, opened the discussion. His contribution to the debate appeared to justify the opinion of senior Naval officers which has from time to time been expressed in this paper. Undoubtedly he meant well, but his didactic manner and the impression he gave that he was perfectly sure that he was right, contrasted with the fact that to anybody with any knowledge of aviation it was perfectly evident that his views on aviation were at least four years out of date, entirely destroyed any good effect that his excellent intentions might otherwise have created. To begin with he was good enough to endorse what Sir Hugh Trenchard had said about the need for success in Civil Aviation as a basis for Service Aviation. This at any rate, seemed to indicate that Rear-Admiral Chatfield appreciates the fact that it was the trawlers and the Mercantile Marine rather than the Royal Navy which preserved Great Britain's sea communications during the war.

His knowledge of aviation may be gauged by his statement that Naval aviation had made but little progress owing to the difficulties involved. He omitted to state that practically the only difficulty involved was that of overcoming the inertia of the Naval mind. He stated that Naval flying had mostly been done from the coast. One questions this as a fact, but if true it is a fault for which the Navy alone is to blame, seeing that the first successful Naval operation of the war was the bombing of German coast towns by the despised Royal Naval Air Service in 1914.

Admiral Chatfield said that the possibilities of Naval Aviation were recognised, but that the low endurance of seaplanes made it impossible for them to accompany the Fleet except when carried on warships. He might just as well have complained of the short range of guns which makes it necessary to carry them on warships. Evidently he does not in the least appreciate the function of seaplanes in war.

He quoted, in support of his idea, the Christmas Day raid of 1914, in the Helgoland Bight, when seven seaplanes went up and four came down in the sea and were lost. He did not mention that these four were lost because the Navy was not on the spot to rescue them, nor did he mention that a more intelligent appreciation of the value of seaplanes before the war by the Navy would have resulted in the production of engines such as would have brought these machines safely

home. Three years later seaplanes used to start from Yarmouth, go out to the Helgoland Bight and came safely home from it as a matter of routine, but apparently Admiral Chatfield is ignorant of the fact.

Further, he said that the problem of having aircraft with fleets was engaging the attention of all Powers, and that we must make strides in peace time, for though money was scarce, brains were never so active. One can only hope that the Navy's brains are as active as those who are prepared to design and manufacture seaplanes for the Navy, and as those of the officers of the R.A.F. whose misfortune it is to be condemned to co-operate with the Navy.

He said that special Naval types of aeroplanes would in future be purely Naval weapons. Guns and torpedoes were purely Naval (surely the Army makes better shooting with its big guns than does the Navy?). For their guns the Navy depended on Woolwich, Vickers and H.M.S. Vernon, the Gunnery School. For progress in aircraft the Navy must depend on aircraft factories. One suggests that some of the money which the Navy wastes might therefore be expended on Naval aeroplanes.

He said that the value of vertical observation was now being appreciated by sailors, therefore they must have air observation in all weather and in mid-ocean.

A typical point of view was shown by the speaker when he said that the seconding of officers from the Navy to the Air Force was difficult. He said that officers did not like losing influence in the Navy by leaving chiefs who knew them. One would judge from this that promotion in the Navy goes by favour rather than by merit, though one has never ventured to air one's suspicions on this subject.

He suggested that the R.A.F. should depend on civil aviators to supply its personnel. One hardly thinks that civilian aviators would be keen on joining the R.A.F. if they may have to serve with the Navy.

Finally, he said that the Admiralty valued these Conferences as increasing the "air sense" among the public. It is perhaps too much for one to hope that this Conference may instil a little air sense and common sense into the Navy.

The Army's View.

Major-General Sir Philip Chetwode, who followed, provided a remarkable contrast to Admiral Chatfield. Speaking with the accent and manner of the typical pre-war cavalry officer, the Deputy-Chief of the Imperial General Staff managed for about five minutes successfully to deceive certain Air Force officers into the belief that here was in reality a Staff Officer of the type which, though in fact it does not exist, provided journalists and civilian critics with so much imaginary ground for satire during the war. At the end of five minutes these same R.A.F. officers began to see how it is that foreigners, whether friendly or enemy, are so entirely defeated by the British Staff. Seldom has one heard so much solid common-sense talked in so short a time as was delivered by the distinguished officer who was General Allenby's mainstay in the campaign in Palestine.

Sir Philip said that the Air Marshal rather harped on wanting the help of the Army, and remarked that surely the Army must be mad if it did not extend such support. He asked the Air Force not to be impatient. No great Army leader could say to-day what would be the constitution of a Division in the next war, but certainly the aviator would not disappear. The last war was won by time, and it was the spade which gave us the necessary time, but the spade would never do it again. The General Staffs of the world were now engaged in a complicated and colossal process of digestion, and one of the chief tasks of the future was to evolve what he called a "quick-movin', hard-hittin' machine."

He stated emphatically that though the Army and the R.A.F. might be separate services, they must be one in training. As regards the seconding of Army officers, though he sympathised with the Air Marshal, he was unconvinced by his arguments. Nevertheless, the Army was giving to the Air Force the officers the Air Marshal wanted.

He stated that in his opinion the observer in the air should be a highly trained staff officer, and he did not see how a young officer who had just left the square could become a highly trained staff officer. Sir Philip ended by reasserting the Army's intention to co-operate in the fullest degree with the R.A.F.

Sir William Joynson Hicks, M.P., avowed himself impatient for the development of the R.A.F. He suggested that the Government should create a Digestion Department at the War Office and give the rest of the Army an emetic to get rid of old ideas. One fears that this is rather a good example of the uninformed criticism for which the Air Marshal asked in the early part of his paper.

Sir William was distinctly humorous on the subject of Egypt as a neutral country, and missed rather a good opportunity when he omitted to refer to the fact that we have created a Jewish centre in Palestine, where we might establish the Headquarters of the R.A.F. Middle East Command so that the Jews may get all the profit accruing therefrom.

He made the consoling statement that in the next war it would be the civilians who would suffer first, thanks to air raids by the belligerent nations.

Sir Sefton Brancker expressed his doubt as to whether the Air Marshal had heard of Clausewitz before the war. Apparently by way of amends he said that General Trenchard had during the war created the tradition which war pilots needed. He said that in future wars the R.A.F. would be cavalry, destroyers and cruisers all at once and would also attack the enemies' centres of supply.

The best reserve for the Royal Air Force would be a flourishing Civil Aviation Service. It was commercial money which made the Mercantile Marine which did so much to save the country during the war. Financiers would not touch aviation to-day, and so no such reserve could be created.

As regards future wars, he thought that the R.A.F. itself would be what the Independent Force R.A.F. had been during this war, and that the Navy and Army would have their own aeroplanes for domestic duties. Navy and Army officers need not be pilots, but they should be trained for air work. The R.A.F. might train civilians as pilots and then send them back to civil life. In the present Budget the R.A.F. was not getting its share.

Lieut.-Colonel the Master of Sempill said that more attention should be paid to Civil Aviation, and especially to the technical personnel in the R.A.F. itself. The status of technical officers was not given enough consideration. They should have more time for their own work and have less regimental and administrative work to do. There was at present no scheme for obtaining officers with technical training.

The technical officers employed in the Department of Research were excellent, but they needed refreshing at intervals by closer contact with the R.A.F. He asked how technical officers are to be replaced. People would certainly not come into the R.A.F. from civil aviation if they were already in good jobs.

One suggests that Colonel Sempill's brief but eminently sensible remarks deserve special attention from the Air Council. The shortage of good technical officers in the R.A.F. is already a serious matter and must affect not only the efficiency, but the actual effectiveness of the Air Force.

Sir E. H. Tennyson-d'Eyncourt, Director of Naval Construction, said that attention had already been given to the design of ships suitable to carry aircraft in peace and in war. Mail steamers which could despatch aeroplanes from their decks and receive aeroplanes on them are already a practical proposition and such ships could carry twenty or thirty machines. They would not be economical, and so would probably need subsidies. He asserted that there are as yet no reliable ocean-going aeroplanes. In view of recent fog experiences one ventures to suggest that there are no absolutely reliable ocean-going ships.

Sir Hugh Trenchard briefly returned thanks for the reception given to his paper. The Marquess of Londonderry closed the meeting with a few of his usual sensible remarks as to the value of aviation and the need for further progress.

LONDON—BERLIN—LONDON.

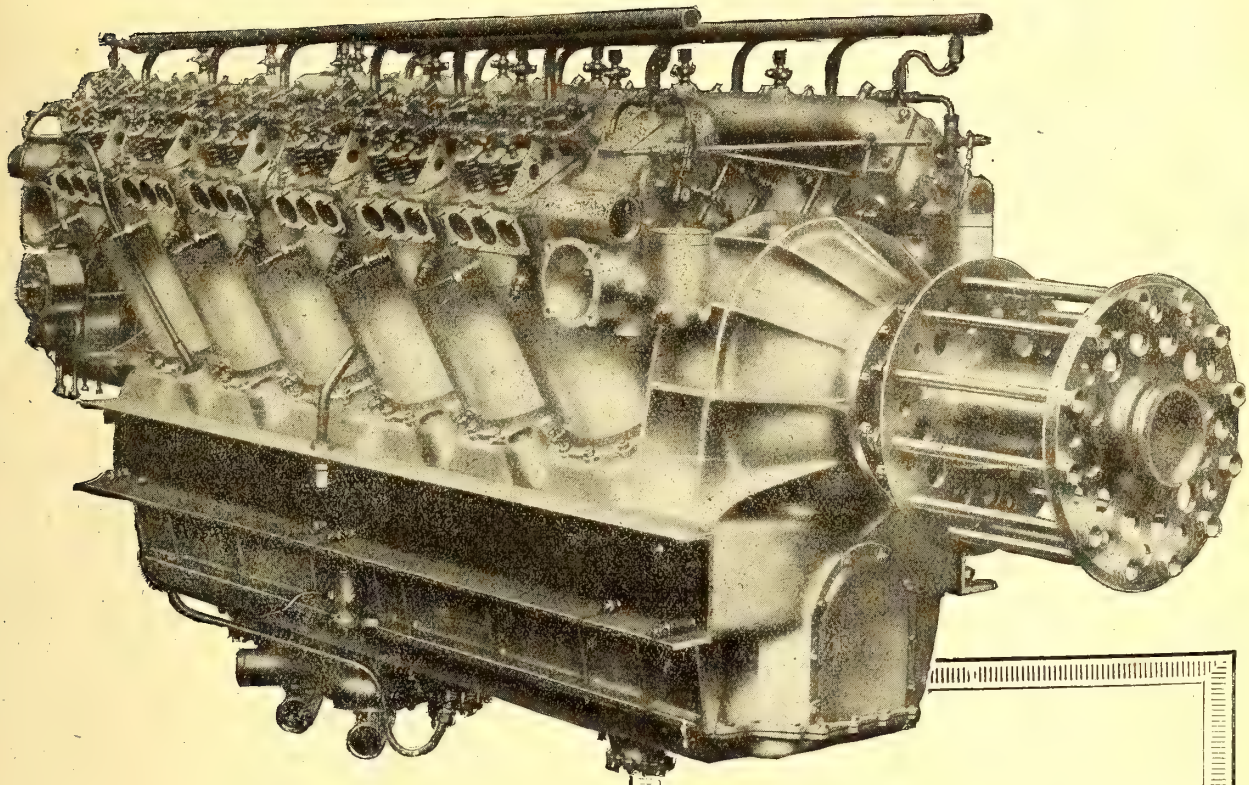
A very fine commercial flight has just been completed on D.H.9 G-EAUP, owned by Handley Page Transport, Ltd., with Mr. Vaughan Fowler as pilot. The machine was originally chartered by two business men to go to Copenhagen. It left Cricklewood on the 18th at 15.15 in the teeth of a gale for Brussels, which was reached at 18.30; restarting for Hamburg the next day at 13.00 and arriving at 18.20. Leaving the following morning at 10.30, the Danish capital was made at 12.20.

While at Copenhagen the passengers found that an extension of the journey to Berlin was essential, and they wired for permission to Handley Page Transport to extend the flight. Permission was readily granted and they restarted at 10.00 on the 22nd, arriving at Johannisthal aerodrome, Berlin, at 13.05. The Germans gave them every possible help and were exceedingly civil.

They started the homeward journey at 09.15 on the 25th and landed at Cologne at 12.25. They left again at 14.10 and landed at Cricklewood at 17.10.

In pre-war days the fastest time to Berlin by ground methods occupied 22 hours.

The time taken from Berlin to London is full of suggestions as to possibilities of what might have been done to Berlin had the end of the war been postponed for a bit. Handley Page Transport, Ltd., and Mr. Vaughan Fowler are to be heartily congratulated on this excellent performance.—G. D.



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CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A. — Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

OCTOBER 18th:

A.T.T., DH16, G-EAQS, London-Paris, 10.00—, G.&M., 3, Armstrong.
A.T.T., DH9, G-EAGY, London-Amsterdam, 10.09-12.20, G., Nil, Robins.
A.T.T., DH9, G-EAOZ, London-Paris, 10.30—, G., Nil, Bamber.
M.A., Breguet, F-CMAI, London-Paris, 13.05-16.30, G., Nil, Lesec
A.T.T., DH9, G-EAQL, Amsterdam-London, 14.40-17.42, G.&M., Nil, Duke.

OCTOBER 19th:

A.T.T., DH18, G-EARO, London-Paris, 10.04-12.30, G.&M., 6, Forson.
A.T.T., DH16, G-EAPT, London-Amsterdam, 10.41-13.43, G., Nil, Milnes.
A.T.T., DH9, G-EAQN, London-Paris, 15.45-18.15, Nil, Nil, Carter.
A.T.T., DH16, G-EASW, Paris-London, 10.25-12.34, G., 2, Lines.
M.A., Breguet, F-CMAF, Paris-London, 13.25-15.40, G.&M., 1, Challoux.
G.E.A., Goliath, F-GEAB, Paris-London, 14.05-16.30, G., Nil, Labouchere & 1.
A.T.T., DH16, G-EAQS, Paris-London, 15.45-17.35, Nil, 4, Armstrong.
A.T.T., DH9, G-EAOZ, Paris-London, 15.25-18.00, G., 1, Bamber.
A.T.T., DH9, G-EAGY, Amsterdam-London, 15.10-18.05, G.&M., Nil, Robins.
H.P.T., Bristol, G-EASH, Brussels-London, 16.20-18.16, M., Nil, Hope.

OCTOBER 20th:

A.T.T., DH16, G-EAPM, London-Paris, 09.30-12.40, G.&M., 2, Holmes.
A.T.T., D.H.16, G-EALU, London-Amsterdam, 10.20, 13.22 G., 1, Lines.
A.P.B., Westland, G-EAJL, London-Paris, 11.45-14.23, G., Nil, Campbell Orde.
M.A., Breguet, F-CMAF, London-Paris, 12.25-15.30, Nil, Nil, Challoux.
G.E.A., Goliath, F-GEAB, London-Paris, 13.20-16.35, G., 1, Labouchere & 1.
A.T.T., DH16, G-EAQS, London-Paris, 15.30-17.50, G.&M., 2, Armstrong.
A.T.T., DH9, G-EAQN, Paris-London, 10.25-12.20, Nil, 2, Tebbit.
C.T., Nieuport, F-CGTY, Paris-London, 12.25-14.30, M., Nil, Le Comte.
A.T.T., DH16, G-EAPT, Amsterdam-London, 14.30-17.28, G.&M., Nil, Milnes.
G.E.A., Goliath, F-GEAC, Paris-London, 14.55-17.35, G., Nil Favreau & 1.
A.P.B., Westland, G-EAMV, Paris-London, 15.13-17.20, Nil, 2, McMullin.
A.T.T., DH18, G-EARO, Paris-London, 15.35-17.46, G., 5, Forson.

OCTOBER 21st:

A.T.T., DH16, G-EASW, London-Paris, 09.38-12.25, G.&M., 1, Robins.
A.T.T., DH9, G-EAOZ, London-Amsterdam, 10.00-12.15, G., Nil, Duke.
A.P.B., Westland, G-EAMV, London Paris, 10.45-13.15, G., 1, Powell.
C.T., Nieuport, F-CGTY, London-Paris, 11.50-14.10, Nil, Nil, Le Comte.
A.T.T., DH16, G-EAQS, London-Paris, 15.30-17.30, G.&M., 1, Tebbit.
A.T.T., DH9, G-EAQA, Amsterdam London, 08.00-12.41, Nil, 2, Hinchcliffe.
A.T.T., DH16, G-EAQS, Paris-London, 10.35-12.35, Nil, 3, Carter.
M.A., Breguet, F-CMAI, Paris-London, 12.25-14.56, M., 3, Martel.
M.A., Breguet, F-CMAB, Paris-London, 13.10-15.35, G., Nil, Le Men.
A.T.T., DH16, G-EALU Amsterdam-London, 14.35-17.53, G.&M., Nil, Lines.
A.T.T., DH16, G-EASW, Paris-London, 15.15-17.45, G., 3, Armstrong.

OCTOBER 22nd:

G.E.A., Goliath, F-GEAC, London-Paris, 13.46-16.25, G., 1, Favreau & 1.
A.T.T., DH18, G-EAUF, London-Paris, 14.10-16.20, G.&M., 6, Forson.
A.T.T., DH16, G-EAPT, London-Amsterdam, 14.17-16.10, G., 2, Milnes.
M.A., Breguet, F-CMAB, London-Paris, 14.28-16.45, G., 1, Le Men.
M.A., Breguet, F-CMAI, London-Paris, 14.35-17.00, Nil, 2, Martel.
A.T.T., DH16, G-EASW, London-Paris, 15.30-18.00, G., 3, Carter.
A.T.T., DH16, G-EAQS, Paris-London, 11.55-14.08, Nil, 3, Robins.
S.N.E.T.A., DH9, O-BIEN, Brussels-London, 13.00-16.15, G., 2, Delzenne.
A.P.B., Westland, G-EAJL, Paris-London, 14.25-17.08, G., 1, C. Orde.
A.T.T., DH9, G-EAOZ, Amsterdam-London, 15.00-13.29/23, G.&M., Nil, Duke.

OCTOBER 23rd:

A.T.T., DH9, G-EAQN, London-Amsterdam, 12.17-14.31, G., Nil, Lines.
A.T.T., DH18, G-EARO, London-Paris, 12.35-15.10, G.&M., 6, Armstrong
S.N.E.T.A., DH9, O-BIEN, London-Brussels, 15.05-17.55, Nil, 1, Delzenne
A.T.T., DH18, G-EAUF, London-Paris, 15.38-18.00, G.&M., 6, Holmes.
A.T.T., DH18, G-EAUF, Paris-London, 11.00-13.22, G., 1, Forson.
M.A., Breguet, F-CMAG, Paris-London, 13.05-15.32, G.&M., Nil, Le Sec.
A.T.T., DH16, G-EAPT, Amsterdam-London, 14.30-17.37, G., 1, Milnes.

OCTOBER 24th:

A.T.T., DH9, G-EAQL, London-Paris, 12.25-14.17, Nil, 1, Bamber.
A.P.B., Westland, G-EAJL, London-Paris, 12.54-15.40, Nil, 1, McMullin
A.T.T., DH16, G-EAQS, London-Berck, 14.10—, Nil, Nil, Forson.
A.T.T., DH18, G-EARO, Paris-London, 11.30 13.30, G., 5, Armstrong.
A.P.B., Westland, G-EAMV, Paris-London, 12.15-14.00, Nil, 3, Powell.
G.E.A., Goliath, F-GEAB, Paris-London, —15.55, G., Nil, Patin & 1.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

OCTOBER 18th:

H.P.T., DH4a, G-EAVL, Amsterdam-London, —11.55, M., Nil, Foot.
H.P.T., DH9, G-EAUP, London-Copenhagen, 15.20—, Nil, 2, Fowler.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.57—, G.&M., Nil, Olley.
H.P.T., DH9, G-EAUI, London-Brussels, 14.57-09.40 (19th), Nil, G.&M., Hope.

OCTOBER 19th:

H.P.T., HP, G-EATH, London-Paris, 12.15-15.45, G., 8, Brackley & 1.
H.P.T., DH9, G-EAUN, London-Brussels, 14.45—, G.&M., 1, Foot.
H.P.T., DH9, G-EATA, London-Amsterdam, 14.45—, G.&M., Nil, Rogers.
H.P.T., DH4a, G-EAVL, Amsterdam-London, —14.25, M., Nil, Olley
H.P.T., HP, G-EATL, Paris-London, 13.05-16.10, G., 3, Capps & 1.

OCTOBER 20th:

H.P.T., HP, G-EASL, London-Paris, 12.15-16.10, G., 2, Beal & 1.
H.P.T., DH9, G-EATA, Amsterdam-London, —12.05, M., 1, Rogers.
H.P.T., DH9, G-EAUN, Brussels-London, 12.10-14.05, Nil, Nil, Foot.
S.N.E.T.A., DH4, O-BABI, Brussels-London, 12.05-14.07, G.&M., 1, Briere.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 15.00-17.10, G.&M., Nil, Olley.
H.P.T., DH9, G-EATA, London-Brussels, 15.02-18.10, G.&M., 2, Capps.
H.P.T., HP, G-EASY, Paris-London, 12.45-16.03, G., 6, Brackley & 1.

OCTOBER 21st:

H.P.T., HP, G-EATL, London-Paris, 12.17-15.35, G., 6, Bager & 1.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 14.45-17.20, G.&M., 2, Briere.

OCTOBER 22nd:

H.P.T., DH9, G-EATA, Brussels-London, 12.30-15.05, G.&M., Nil, Capps.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 12.40-15.50, G.M., 2, Rigaud.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 12.00-15.55, M., Nil, Olley.
H.P.T., HP, G-EATJ, Paris-London, 13.00-16.45, G., 7, Jones & 1.

OCTOBER 23rd:

H.P.T., HP, G-EASY, London-Paris, 14.20-17.50, G., 7, Capps & 1.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 12.05-14.35, G.M., 2, George
S.N.E.T.A., DH4, O-BALO, London-Brussels, 14.40-17.50, M., Nil, Rigaud
H.P.T., DH9, G-EATA, London-Amsterdam, 15.03-Landed at Lympne, G.&M., Nil, Hope.
H.P.T., HP, G-EASN, London-Brussels, 14.48-18.20, G., 6, Rogers & 1
H.P.T., HP, G-EATH, Paris-London, 13.30-15.40, Nil, 7, Beal & 1.

OCTOBER 24th:

H.P.T., HP, G-EATH, London-Paris, 13.18-16.00, Nil, 3, Jones & 1.

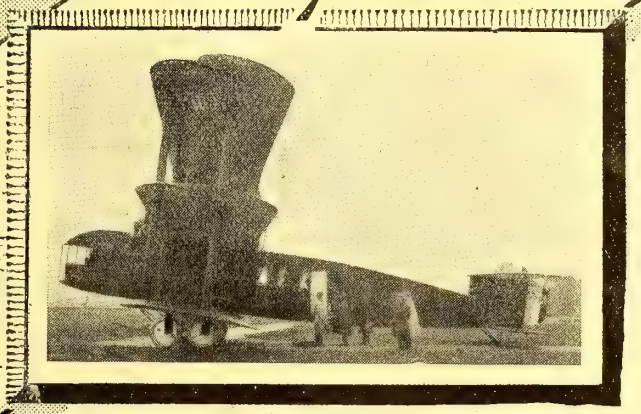
Inland Flying at Croydon.

Oct. 18th.—A.T.T., DH16, 1 test; I.A.L., "Bat," 1 test.
Oct. 19th.—A.T.T., DH9, 1 joy-ride; DH16, 2 tests; M.W.T.C., DH6, 1 test; I.A.L., "Vimy," photography; Bournemouth Aviation Co., Avro from Ilford to Bournemouth.
Oct. 20th.—A.T.T., DH9, 5 joy-rides; M.W.T. Co., DH6, 1 test.
Oct. 21st.—A.T.T., DH18, 5 tests; M.W.T. Co., DH6, 1 test.
Oct. 22nd.—H.P.T., DH9, Cricklewood; R.A.F., DH9, Kenley return.
Oct. 23rd.—A.T.T., DH9, Southampton return; I.A.L., "Bat," 1 test.
Oct. 24th.—Nil.

Inland Flying at Cricklewood.

Oct. 18th, 19th.—Nil.
Oct. 20th.—H.P.T., Handley Page test; H.P. Bristol (Hispano) from Croydon.
Oct. 21st.—H.P. DH9, (H-9140, machine with new H.P. wing), 3 demonstrations; SE5 test; Bristol test; H.P.T. DH9 demonstration.
Oct. 22nd.—H.P.T. DH9 and Handley Page test
Oct. 23rd.—H.P.T., DH9, from Croydon.
Oct. 24th.—William Beardmore, Ltd., WB8 test; H.P. Sopwith "Pup" from Castle Bromwich.

The "Bristol" Aeroplanes



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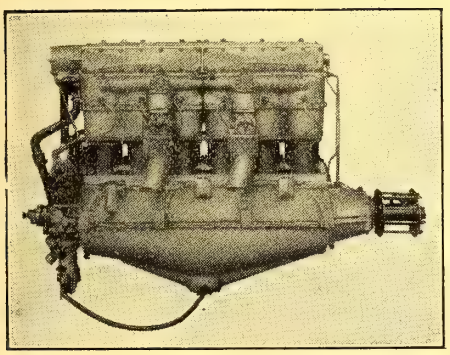

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AIRCRAFT IN PARLIAMENT

Oct. 21st, the following written answer was given :—

AIR MINISTRY.

Mr. Churchill, in reply to Mr. Waterson, said that the total staff employed at the Air Ministry Headquarters numbered 2,474 on Oct. 16th, 1920. The weekly cost was approximately £16,900; the highest and the lowest salaries, including war bonus, were £3,500 and £60 per annum respectively.

COMING EVENTS.

NOVEMBER.

First week.—Latvian Trade Fair, Riga, closes.
2nd, Tues.—International Aero Exhibition, Prague, closes.
4th, Thurs.—R.Ae.S lecture "The Human Machine in Relation to Flying," by Col. Flack.*
6th, Sat.—Grain Air Station dinner, at Hotel Jules, Jermyn Street, S.W., Sec., Capt. L. A. T. Pritchard, Foxhill, Sutton Coldfield.
10th, Wed.—35 T.D.S. Dinner. Particulars from Mr. H. R. Boasten, Carlyle Club, Piccadilly, W.1.
12th, Fri.—Engine Repair Shops (France). Reunion at Holborn Restaurant. Secretary, Flo. D. Drover, Room A.243, Air Ministry.
13th, Sat.—Second Annual Reunion Dinner of Redcarites. Particulars from Mr. W. E. Crozier, c/o., Bank of Adelaide, 11, Leadenhall, Street, E.C.3.
17th, Wed.—R.Ae.S. Annual Dinner at 7.30 p.m., at the Connaught Rooms. Tickets (price 21s. exclusive of wines) from Sec.
18th, Thurs.—R.Ae.S. lecture. "The Problem of the Helicopter," by M. Louis Damblanc.*

DECEMBER.

2nd, Thurs.—R.Ae.S. lecture. "Airship Mooring," by Flight Lt. F. L. C. Bitcher, and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.*
16th, Thurs.—R.Ae.S lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Instalment of Aeroplane Engines," by A. T. Rowledge.*

JANUARY—1921

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr H. W. S. Outram.*
17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30.

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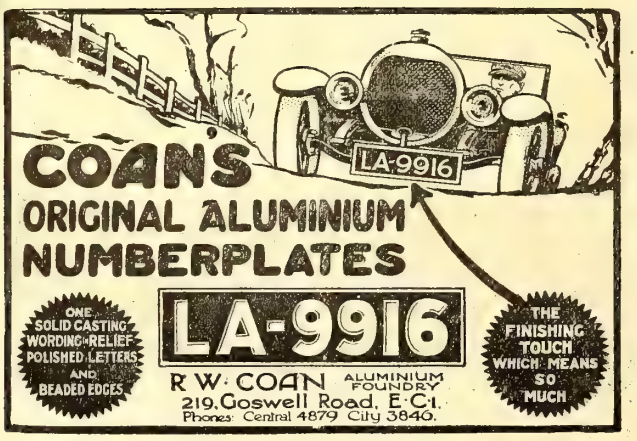

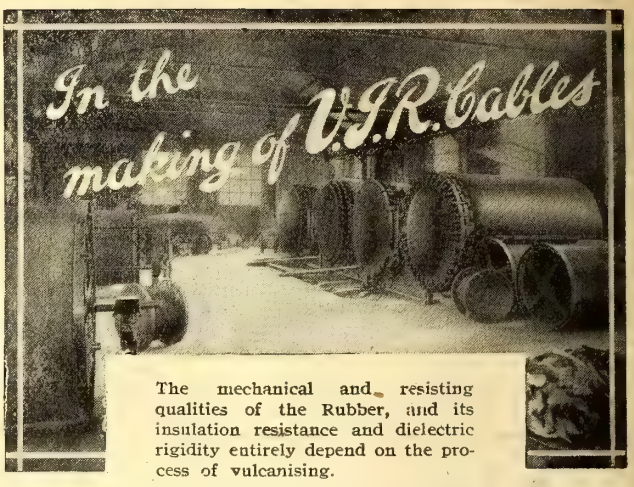

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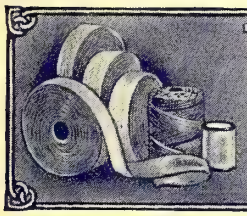

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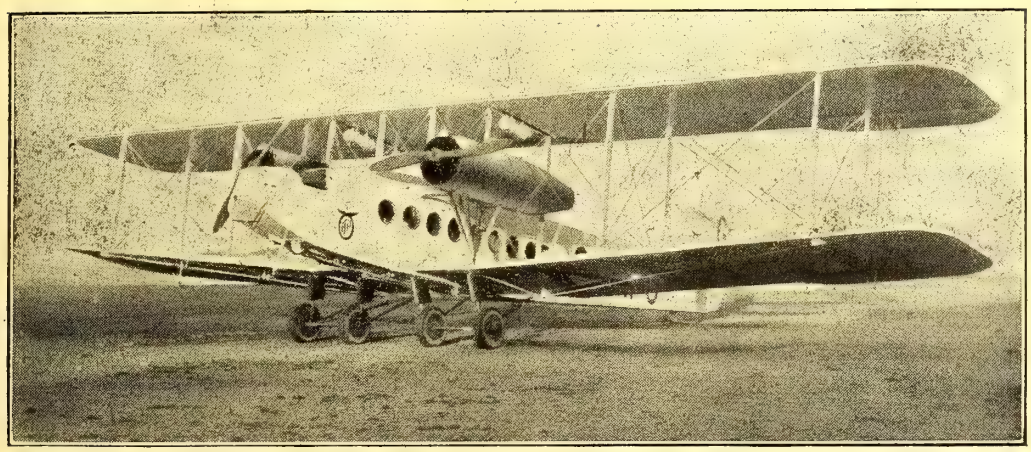

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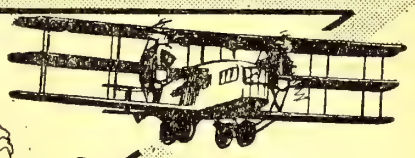

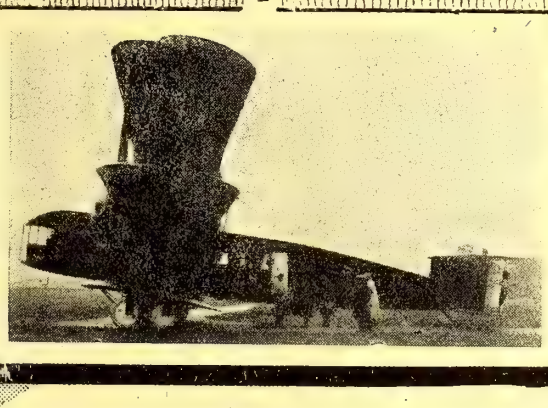

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ON THE NEEDS OF CIVIL AVIATION.—III.

An Allegory.

A newly married woman in the country made her first attempt at the cooking of cakes on the occasion of a family gathering. When the cakes were handed round the members of the family each took a cake, felt its weight, let it fall on the plate with a dull thud and said, "No, thank you!" Whereupon the young wife in despair gathered the cakes together and hove them out into the yard to the ducks. Half an hour afterwards two urchins came running to the door and shouted, "Hi, Missus! Your ducks have sunk!"

Which thing is an allegory, more or less, of Civil Aviation. The young Department of Civil Aviation has, with the best intention in the world, prepared rules and regulations, propagandist sub-departments, Air Conferences, inspectors, lighthouses, and all sorts of good things, which do not seem to be appreciated as they should be by the aeronautical community. And the aeroplanes, whose operations should have been encouraged by this luxurious feeding, seem to have sunk.

At any rate, if they have not actually sunk, they are not at the moment operating as actively as they might have done if they had been handled differently. For example, the Amsterdam-Rotterdam-London postal and passenger service has been stopped. And on a perfectly gorgeous Saturday afternoon recently there was no flying at Cricklewood; nor on the following Sunday—a still more gorgeous day—was there any flying at Croydon.

Surely something is wrong when such an important service as that between England and Holland is stopped on the feeble excuse that the weather is too bad in the winter, and when Londoners cannot see any flying in the best of weather. We were, in fact, in a far better state before the war, when one could always see plenty of flying at Hendon or Brooklands any week-end, wet or fine.

What the Public Thinks.

It is true that the impoverished aviation firms cannot afford to burn petrol just to amuse the populace, but it is equally true that in the interests of aviation the Public should have opportunities of flying and of watching flying. The Public is keenly interested in aviation. Witness, for example, the huge crowds at the R.A.F. Tournament, and the very considerable crowds at the Aerial Derby, despite an apparently impossible morning.

Also, there was an enormous concourse of people at the demonstration at Croydon during the Air Conference. There were thousands at Croydon for the Buc-Croydon-and-back race. And quite a large number came to Cricklewood on a Thursday afternoon to see the trials of the new Handley Page wing. Also, on the beautiful Sunday afternoon to which one has referred above, many hundreds of people came to Croydon on the off chance of seeing some flying, and they were grievously disappointed.

Therefore it seems to be one of the first duties of the Air Ministry to do something of a practical nature to interest people in London in flying and to give them an opportunity of taking the air when so disposed.

Hitherto the Instone Air Line has allowed its Vickers "Vimy" to take up passengers on Sunday afternoons at Croydon, and on many fine afternoons the spectators have almost fought for tickets for joy-rides. Since the Air Conference, however, the machine has not been out, though one is not aware whether this is by way of a strike for a subsidy or merely because joy-riding with a "Vimy" is not a commercial proposition. And neither at Cricklewood nor Croydon does it seem to be worth anybody's while to take people for short trips. At any rate, the fact remains that Londoners or visitors to London who want to fly or see flying have no opportunity of doing so.

£50 per Passenger.

One does not for a moment suggest that the Department of Civil Aviation is not spending to the best advantage such money as it can extract from our vote-catching Government. But one does say most emphatically that without spending any more money it might achieve very much greater results. It is expenditure of brains and energy, rather than money, which is needed.

A critic of the Department produced quite an amusing argument the other day, which, though entirely fallacious, may be put up against the Department with dire effect unless the Department does more to justify its existence in the eyes of the taxpayer.

According to this critic, the Department of Civil Aviation costs £500,000 per annum. The sole and only useful work it does is to regulate the cross-Channel air lines: for there is no other civilian air traffic in this country. The cross-Channel air lines carry at most 10,000 passengers in the year. Therefore it costs the nation, by way of the Department of Civil Aviation, £50 to "regulate" each passenger across the Channel, though the passenger himself or herself only pays on an average a fare of £10.

The charge is unjust, because the organisation which has been set up could equally well regulate 100,000 or 1,000,000 passengers per annum, but, as we are not likely to touch even the lower figure for some years to come, the statement is true at the moment. One suggests, therefore, that in its own interests the Department will do well to make some sort of a show of activity in other directions, and one of the most obvious of possible directions is that in which the Public can gratify the modern love of flying.

The Encouragement of Aviation.

Quite a simple step towards this end would be the direct encouragement of pleasure flying at the London Terminal Aerodrome at Croydon—and no doubt Handley Page, Ltd., would provide equal encouragement at Cricklewood if assisted by the Department, for obviously it would be all to the firm's advantage to accustom the Public to come to Cricklewood and acquire familiarity with Handley Page Transport.

There are at present, in various parts of the country, parties of energetic young men, pilots and mechanics, who have been doing more or less well out of what is commonly called "joy-riding." Probably the two most active are the Berkshire Aviation Co., of which Mr. J. D. V. Holmes is the moving spirit, and the Northern Aviation Co., of which Captain John Oliver is the chief pilot. The former have been running quite successfully for well over a year, and the latter have been very active this past summer.

One suggests that if these and/or other similarly experienced "joy-ride" firms could be induced to make Croydon or Cricklewood their winter quarters much good would result. The Department of Civil Aviation could very well afford to give them free housing for their machines, and to exempt them from all landing fees and other charges. This would not cost the Department anything in actual outlay: it would merely be denying itself a few pounds of income, which it would not get in any case.

Then the Director of Information, Major-General Swinton, might direct a considerable amount of information to the daily Press, pointing out to them that at last arrangements had been made by which anybody in London who wanted to see or do any flying would be perfectly sure of attaining their desires at Croydon or Cricklewood any fine Saturday or Sunday afternoon, and that flights could be booked, either for short trips or for genuine business journeys over long distances, any day by arrangement. And thus a regular aerial taxi trade might be established.

It might be advisable for General Swinton to interview the editors of the leading papers himself and enlist their personal interest in a pro-aviation propagandist campaign, and it would not do to let minor officials deal with hooligan reporters. One feels certain that the average editor still has so much respect for a real live General as to be vastly complimented by a personal call from him. Such a method of approach would make all the difference.

Furthermore, Mr. Handley Page's suggestion at the Air Conference might be adopted, and a little gentle personal

persuasion by some of the extremely amiable and diplomatic officials at the Department of Civil Aviation might induce Sir Marcus Samuel and his brother Samuel to expend some of their immense surplus profits in a handsome gift of free petrol for these propagandist joy-ride machines. Similarly, Sir Charles Wakefield, ever in the van where disinterested philanthropy is concerned, might make a donation of free Castrol : for this specific purpose only, *bien entendu*.

A Certain Success.

If assured of free housing, free "aerodromage," free advertising and free oil and petrol—all of which would cost the Air Ministry nothing and so could not be regarded as subsidies—it is certain that quite a number of pilots and mechanics would join in this educative campaign, for they would be fairly sure of making a good living out of the passenger fares when their chief expenses had thus been removed.

When once it became known that flying could certainly be seen on Saturdays and Sundays the Public would flock to Croydon and Cricklewood in its thousands, especially as admission would be free. And when these aerodromes had become popular resorts, much as Hendon and Brooklands used to be before the war, but on a much bigger scale in these days when so many hundreds of thousands of people have flown, then a special reserved enclosure might be set up for the *élite*. The proceeds from this enclosure could then be devoted to prizes for races between the local joy-ride machines, or between real racing machines if manufacturers cared to send them to the aerodromes.

The Best Possible Advertisement.

Free housing and the abolition of landing fees, even without free petrol, would also tempt manufacturers to send over their new types while on test, just as machines of all sorts came over to Croydon for the Air Conference demonstration. Thus keen students of aviation would know that the latest productions were always to be seen at the London aerodromes during the week-ends.

And this would be the best possible advertisement for British aircraft, for it would amount to a perpetual aero-show. Not only boys, such as he who recently had the honour of presenting a model to the Prince of Wales, as the result of studying aviation at Hendon years ago, but buyers from all foreign nations would be constantly on the watch for new types.

Then, as suggested in this paper a few weeks ago, the Department of Civil Aviation could make a special feature of inviting selected groups of people to visit the Croydon Aerodrome, and "stay to tea," on Sunday afternoons, so as to interest them in Civil Aviation. Thus the editors of trade and technical papers would be invited first of all, so that they might be induced to preach Air Transport to their own particular trades. Then the councils of the employers' federations in the drapery trade, and the fancy goods trade, and the bankers' trade, and all the other trades which might be reasonably expected to use air transport, would be invited to come and see for themselves.

One can trust Mr. Handley Page to do so much at least at Cricklewood to impress on possible users the value of Handley Page Transport, Ltd., but he might have difficulty in getting other makers to send their machines to assist at his demonstrations. Therefore one suggests that big combined demonstrations, to include the Handley Page machines, at Croydon would be better.

It seems well to emphasise the fact that these demonstrations should take place on Sunday afternoons, when people in business have nothing much to do and are easily drawn to any place of interest.

The Duty of the Department

Thus the mere "joy-ride" public and the great commercial classes could all be interested in Civil Aviation at practically no cost to the Air Ministry, except perhaps spoiling the Sunday afternoons of a few officials. All that is needed is a little real energy and organisation.

The Public, both those who count a lot and those who do not count for much, are already interested in flying, but much deeper education is necessary. All that is wanted to achieve this is to let the Public know where flying is done and to assure that it will be done when the Public goes to see it. Surely it is for such purposes as those that the Department of Civil Aviation exists and draws its more or less handsome pay.

A Powerful Argument.

There is yet another reason why it is worth the Air Ministry's while to take active steps to arouse interest in flying. At present not a vote is to be won or lost over aviation. Whether we hold the leading position in the air or not will make no difference in the election of an M.P. or in a division in the House.

But, when once the public is properly educated as to the uses of flying, and when once the shop-keeping business man has been taught the benefit of air transport, then aviation will be a vote-catching proposition. And when that happy day arrives the Department of Civil Aviation will be able to demand what Vote it likes, and get it as easily as the Navy gets its money. And then it can raise its own pay to a really handsome amount.

So you see it is to everybody's interest that the Department of Civil Aviation should wake up and see that its ducks do not sink.—C. G. G.

A BELGIAN FAUX PAS.

It is not in England and France only that the Air Post is hindered by official stupidity. In Belgium also, just when the Air Postal Service is becoming a real benefit to the business community, obstructions are put in the way of progress. It appears that the Belgian military authorities have commandeered the plain of Wilrijck, which has been used by the S.N.E.T.A. during the past few months as an aerodrome. This effectively stops any direct air mail service between London and Antwerp, and it is well to remember that the business of Antwerp is many times greater than the business of Brussels, so that there is every reason for running the air mail direct to Antwerp, whereas if both Brussels and Antwerp cannot have an air mail service it would be better to cut out Brussels and retain the Antwerp service.

Just what has caused this absurd action on the part of the Belgian authorities one cannot explain, for one has always understood that the Belgian Army believed very firmly in aviation and has endeavoured to assist aviation as far as possible since the war. In fact, Belgium is one of the few nations which has actually an Air Attaché in London, and the Chevalier Willy Coppens who holds that post has himself done a very great deal to assist the smooth working of air lines between Belgium and London.

As an example of the futility of the air mail arrangements in Belgium one need only quote the fact that London papers sent by boat and rail in the morning reach Antwerp at 9.30 the same night, whereas London correspondents of Antwerp papers who have tried sending a selection of morning newspaper cuttings by mid-day air mail from London arriving in Brussels before 3 p.m. find that their packets do not reach Antwerp the same day at all, but are delivered next morning, which is too late for use.

If the Antwerp Aerodrome were placed on a permanent basis letters and parcels would leave London somewhere about mid-day and would reach Antwerp at any rate in the middle of the afternoon, and thus would beat the boat and rail by many hours; but owing to the astoundingly foolish way in which the Belgian authorities, postal and otherwise, have acted it is actually quicker and better to send letters and articles by ordinary rail and boat post. It is only passengers or parcels for which the recipients call at the aerodrome at Brussels which obtain any advantage by going by air mail.

It is to be hoped that the British Department of Civil Aviation and the Belgian Air Attaché will take proper steps in the interests of aviation to remedy this official idiocy.

THE LAY PRESS AND AVIATION.

The following letter has been received :—

Authors' Club, S.W., Sept. 30th, 1920.

Sir,—I am not going to say "my attention has been called" to the current issue of your paper, because, to tell you the truth, I often buy it to see if you are having "another dig at me." But, if you will allow me, I should like you to publish these few thoughts that have arisen from your remarks on page 576. If I am not brief enough you have your remedy in the blue pencil.

Referring to me as "the Winchesters" in a paragraph dealing with the escapades of one Enrico Mario T. Casalegno Woodhouse, you impute that I am one of the "hot air merchants" of the lay Press—a charge which I strongly deny. I am as keen a supporter of aviation as you are and I have done my best, in my limited capacity, to interest the lay public in air travel. Most people in their innocent youth commit the indiscretion of publishing a "first novel," or a first book of some sort, and regret it ever after.

You are probably no exception, any more than I am, but you must admit that lay writers on aviation are subject to the caprice of all kinds of editors (some extremely stupid) and very often write accordingly. Lay editors are a quaint species. I am now one myself!

I dare say, when you have been called upon to write for a lay newspaper you have been appalled at what you have been expected to write and what you have written, but I maintain that so long as an article in the lay Press is not absolutely absurd and inaccurate but deals popularly with a difficult subject it is of some definite benefit to the industry

I know, as well as you do, that if I want publicity for an aircraft firm I must (on paper at least) send two kittens, a guinea pig, a baby grand piano, passengers not under the age of 105 or over 5 months, and the like, up in a machine. If I merely state that such and such an aeroplane carried so many pounds of goods my statement is not of sufficient "news value" (whatever that is) to warrant its publication.

This shows you what you ought to know already—the feeble state of many editorial minds. Unless you work on these grounds when you are a lay editor, you get the sack!

By all means go on prodding me if it gives you any pleasure, as I have sufficient sense of humour to appreciate the advertisement, but do give me a little credit for sound sense and good intentions, and not keep all of it to yourself. You might do worse than deal with this question in an article and give a full list of lay writers in order of precedence. I should then know where I stand, and in any case it would make amusing copy for your readers. Please be sporting enough to publish this. (Signed) CLARENCE WINCHESTER.

[Mr. Winchester scores very distinctly by this sporting reply of his. One dare not publish the list of writers to whom he refers, but one can assure him that in such a list he would at any rate be above the majority of those who write on aviation in the lay Press.—C. G. G.

A LITTLE CORRESPONDENCE.

The following letter has been received from Mr. C. D. Thomson, British Representative of *Aerial Age*, New York :—

Oct. 2nd, 1920.

Dear Mr. GREY,—You do enjoy mud-slinging!

It is a game you appear to indulge in just as often as the business barometer takes a sudden swing downwards. But don't you think it is rather a sordid form of amusement? Never elevating or inspiring, and entirely unbecoming those who claim to guide the actions of others.

Your Editorial on "Who's Who in America," which appeared in this week's issue, I have read—to put it mildly—with considerable disgust. Seldom have I seen a case presented with less apparent tact and with such utter contempt for all the laws of British sportsmanship and fairplay, than this, your latest journalistic effusion. For you to find nothing but praise for the actions of the Flying Club, no one need complain. Your standard and theirs appear to be almost on the same level. But why claim to be impartial and then, instead of presenting the case for the other side, fill two-thirds of your editorial space with slanderous statements about an individual member of the Aero Club?

Do you consider this just? Is this your idea of fairplay? Is it becoming for a journal—ostensibly independent and British—to join in a quarrel between two clubs in America, which, after all, is purely an American concern and entirely for the American people to decide?

I am forced to believe that there lies behind this article much more than meets the eye of the casual observer. You very carefully omitted to explain to your readers that the American Flying Club is *not* an independent body. Its title is really a misnomer. For all intents and purposes it should be called the Manufacturers' Aircraft Association Club, because it is financially controlled and has its policies and activities dictated by the above association. You also forget to state that, during the war, a few of the actions of the Manufacturers' Aircraft Association have already been publicly condemned as "vicious and designed to reap large profits by taking advantage of the necessities of the Government." That a clique connected with the above association have formed a conspiracy to control and ruin the Aero Club of America, for the express purpose of preventing the Aero Club from actively co-operating with the Government of the United States in conducting its investigations into the notorious "aircraft scandals." When I recollect that representatives of the Manufacturers' Aircraft Association approached the publisher of the papers you so kindly refer to (*Aerial Age* and *Flying*) and remember that considerable sums of money were offered if these papers would "not interfere" with their plans (though these journals have done and are still doing all they possibly can to expose their vicious schemes), when I recollect all this I cannot help from thinking that, at last, this vile clique has found a journal that's willing to play their game.

I wonder, also, if the readers and advertisers of THE AEROPLANE realise that they have here a British journal actively co-operating and assisting a group of individuals who have done and continue to do everything that's possible to hinder and restrict the activities of British aircraft manufacturers in America. Do they realise that this Manufacturers' Aircraft Association controls the patent rights that have been the source of so much litigation and the loss of British capital? Are they aware that this same clique has endeavoured to impose prohibitive Tariff duties on British machines imported into America?

I feel confident that these facts are not known to them (so far you have skilfully omitted to state them), but I am sure that when they do become known, your present readers and advertisers will have little sympathy and support for a journal that so openly and enthusiastically assists and associates with such a crowd of artful schemers.

I hope you will pardon my rather candid remarks, but I feel that they are justified, and I shall be glad if you can find space to publish this letter. I intend sending a copy to New York.—Yours faithfully, C. D. THOMSON,
British Representative.

The following reply was sent :—

C. D. Thomson, Esq., Oct. 4th, 1920.
Aerial Age,
Regent House,
Regent Street, W.

Dear Thomson,—Thanks very much for your amusing letter of Oct. 2nd. I am afraid that your fiery Scottish temper has got the better of your solid Scottish head. I am sorry that there is not room in THE AEROPLANE to publish the letter, as you leave such splendid openings for me to reply, but, unfortunately, the account of the Gordon Bennett Race will take up all our space this week.

I am afraid you really didn't read my article on "Who's Who in America." If you had done so you would realise that I have said in more or less polite language all the rude things about the Flying Club and its trade connections which you have said yourself.

Also I very carefully explain that the affairs of the Aero Club of every nation are of importance to every other nation, because each Aero Club is part of the National Federation.

You seem mighty sure of your facts considering that you have been concerned with aviation for about five minutes and have only heard one side of the story. Please remember that I have been at this game for just on twelve years and have watched the growth of the whole of this trouble from the very beginning.

On second thoughts, if I can possibly find room, I will publish your letter with this reply, if only for the sake of letting the British Aircraft Industry have a good laugh at your suggestion that THE AEROPLANE is being bribed by the American Aircraft Industry or the Manufacturers' Aircraft Association, or whatever it calls itself. I only wish we could lay hands on some of their money, but unfortunately they seem to be just about as broke as the British Aircraft Industry at the moment.

Primarily my concern is to do my best to develop aviation all over the world, and I am convinced that so far as America is concerned the American manufacturers, whether they are a vile clique (as you say) or not, will make a better job of developing aviation than will the hot-air merchants who made such a mess of the Aero Club of America until the combined manufacturers and flying officers, who composed the American Flying Club, took charge of aviation in the States.

The more progress that is made with aviation in America the better will it be for us here.

(Signed) C. G. GREY (Editor, THE AEROPLANE).

A NEW OUTLOOK FOR AVIATION.

The attention of the more intelligent readers of this paper is particularly directed to two very remarkable articles in this week's issue. On page 729 Captain W. H. Sayers sets forth a point of view concerning the use of aeroplanes for genuinely commercial purposes which will be entirely new to most people, especially to aeroplane and engine designers and constructors. And on page 730 Mr. Ellwood Wilson, Chief Forester of the Laurentide Company, of Grand'mère, Quebec, gives the first perfectly clear and intelligent account ever published of the practical use of aeroplanes in forestry work, as the result of extensive personal experience.

British aircraft firms are requested to note that American machines are used by this British firm operating in British territory. Why? Is it because of lack of enterprise on the part of British business men?

Intelligent study of these articles should be of direct monetary value to those who have the brains to profit by them and the initiative to act upon the opportunities suggested therein.—C. G. G.

TO PRACTICAL AIRCRAFT FIRMS.

Any firm still in active aviation which is in need of a really first class test pilot should note that Mr. L. R. Tait-Cox is now available. Mr. Tait-Cox, who was in the R.A.F., has since the Armistice been the chief pilot to the Nieuport and General Aircraft Company, Ltd.

This company, having now suspended the construction and operation of aircraft, Mr. Tait-Cox, together with Mr. J. H. James, his "chief of staff," are at liberty to co-operate with any progressive aircraft concern. Mr. Tait-Cox's experience and skill in every type of aeroplane from big bombers to fighting scouts and racing machines is unrivalled. At the present time he is the holder of the British speed record which he captured on the "Goshawk."—C. D.

NAVAL AND MILITARY AERONAUTICS.

FROM THE "COURT CIRCULAR."

BUCKINGHAM PALACE, Oct. 12th.

His Majesty held an Investiture in the Ball Room of the Palace at 11 o'clock.

The following were severally introduced into the presence of the King, when His Majesty invested them with the Insignia of—

THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE.—Commanders.—Military Division.—Brig.-Gen. Ralph Bagnall-Wild; The Revd. Harry Viener, R.A.F.; Wing Comdr. Reginald Bone, R.A.F.; Lieut.-Col. Arthur Cheatle, R.A.F.; Lieut.-Col. George Dreyer, R.A.F.; and Lieut.-Col. Harold Outram, R.A.F.

The King then conferred a decoration as follows:—

BAR TO THE ROYAL RED CROSS.—W.R.A.F.—Miss Nance Pounder.

MILITARY.

EXTRACTED FROM WAR OFFICE COMMUNIQUES.

Oct. 18th.—Middle Euphrates.—The 55th Brigade Column occupied Kefl (15 miles north of Kufa) at 9.30 a.m. on the 14th. A band of insurgents, who held a position north-east of the town, fled befroe the advance of the cavalry, and were bombed by co-operating aeroplanes during their flight. Two of our airmen, who had been taken prisoners, and later were released by the insurgents, rejoined the column at Kefl. . .

Diala Area.—On the 13th a cavalry recoanaissance from Shahroban (north-east of Baghdad) was fired on from Amariya. . . . On the 15th aeroplanes attacked and bombed the enemy in this neighbourhood.

Oct. 21st.—Middle Euphrates.—The insurgent force which was bombed by our aeroplanes north-east of Hillah on Oct 7th, consisted of tribesmen from the Hillah and Diwaniya divisions.

Oct. 22nd, Lower Euphrates.—In the Samawa area the relieving column has been carrying out punitive measures on the left bank of the Euphrates, and aeroplanes bombed a hostile band which had gathered in this neighbourhood.

Middle Euphrates.—Aeroplanes have carried out effective attacks on hostile concentrations near Abu Sukhair and Umal Barur (10 miles S.S.E. and nine miles S.E. of Kufa respectively).

Oct. 23rd, Lower Euphrates.—Our aeroplanes have been active, bombing hostile gatherings in the vicinity of Ur and Nasirieh. Strong hostile concentrations in the former area (Samawa and Basra) are reported.

Oct. 26th.—Middle Euphrates.—On the 21st a small column from the 53rd Brigade . . . found a hostile force in position south-east of Musaiyib; . . it was also bombed by aeroplanes and lost heavily. . . .

Diala Area (north and east of Baghdad).—Our aeroplanes on the 26th effectively attacked hostile gatherings east of Shahroban.

Oct. 27th.—Lower Euphrates.—Strong insurgent bands west of Khidr on the 22nd were fired on and dispersed by a reconnoitring force. On the 23rd aeroplanes bombed and fired on other concentrations with good effect, and they appear to have dispersed, as on the 24th aerial reconnaissance reported nothing of note in that quarter.

Middle Euphrates.—Our aeroplanes successfully attacked enemy bands west and south-west of Hillah on the 23rd. Our picket at the Kufa Aerodrome was sniped on the same date. . . The entrenched positions held by the insurgents on both banks of the river between Hillah and Jerboia were bombed by our aeroplanes.

Oct. 29th.—Middle Euphrates.—Our aeroplanes actively bombed hostile camps and concentrations during the 25th, 26th, and 27th; insurgent bands were attacked north-east of Kufa and north of Um al Barur.

Nov. 1st.—Middle Euphrates.—Our aeroplanes have been active against hostile gatherings in the area south-east of Kufa.

AIR FORCE.

THE RECONSTITUTION OF THE AIR COUNCIL.

Extracted from the *London Gazette* of Oct. 19th, 1920.

At the Court at Buckingham Palace, the 13th day of October, 1920.

PRESENT,

The King's Most Excellent Majesty in Council.

WHEREAS by Section 8 of the Air Force (Constitution) Act, 1917, it is enacted that:—

(1) For the purpose of the administration of matters relating to the Air Force and to the defence of the realm by air there shall be established an Air Council consisting of one of His Majesty's Principal Secretaries of State, who shall be President of the Air Council, and of other members who shall be appointed in such manner and subject to such provisions as His Majesty may, by Order in Council, direct.

(2) His Majesty may, by Order in Council, make provision with respect to the proceedings of the Air Council and the manner in which the business of the Council is to be distributed among the members thereof:

And whereas by Section 14 of the Air Force (Constitution) Act, 1917, Orders in Council made under that Act may be varied and revoked by subsequent Orders in Council:

And whereas His Majesty by Orders in Council dated the 21st day of December, 1917, the 2nd day of January, 1918, the 4th day of March, 1918, and the 11th day of May, 1918, made provision with respect to the constitution of the Air Council and the manner of the appointment of the members thereof:

And whereas it is enacted by Section 2 of the Air Navigation Act, 1919, that the purposes of the Air Council shall include all matters connected with air navigation:

And whereas it is expedient to make provision for the reconstitution of the Air Council and to consolidate the said Orders:

Now, therefore, His Majesty is pleased, by and with the advice of His Privy Council, to order, and it is hereby ordered, as follows:—

(1) The Air Council shall consist of the following members, that is to say:—

One of His Majesty's Principal Secretaries of State who shall be President of the Air Council.
The Parliamentary Under Secretary of State for Air.
The Chief of the Air Staff.
The Controller-General of Civil Aviation.
The Director-General of Supply and Research.
The Secretary of the Air Ministry.

(2) Of the members of the Air Council (other than the President) the Chief of the Air Staff shall be appointed by His Majesty and the other members shall be appointed by the Secretary of State.

(3) There may be included in the Air Council such additional members (if any) not exceeding two, as may be appointed by the Secretary of State.

(4) The Secretary of State is to be responsible to His Majesty and Parliament for all the business of the Air Council.

All business, other than business which the Secretary of State specially reserves to himself, is to be transacted in the following principal divisions:—

(a) The Parliamentary Under Secretary of State for Air to be Vice-President of the Air Council and to be responsible to the Secretary of State for so much of the business of the Air Council as may be assigned to him from time to time by the Secretary of State.

(b) The Chief of the Air Staff to be responsible to the Secretary of State for the administration of so much of the business relating to organisation, disposition, personnel, equipment, armament and maintenance of the Air Force as may be assigned to him from time to time by the Secretary of State

(c) The Controller-General of Civil Aviation to be responsible to the Secretary of State for the administration of so much of the business relating to Civil Aviation as may be assigned to him from time to time by the Secretary of State.

(d) The Director-General of Supply and Research to be responsible to the Secretary of State for the administration of so much of the business relating to aeronautical research, inspection and supply as may be assigned to him from time to time by the Secretary of State.

(e) The Secretary of the Air Ministry to be responsible to the Secretary of State for such duties discharged by the Air Ministry as are not assigned to other members of the Council, for the control of expenditure, and for the co-ordination of Air Ministry business; and to be also designated Secretary of the Air Council and as such charged with the preparation of all official communications of the Council.

(5) Subject to the foregoing provisions as to the transaction of business in separate divisions the powers and duties of the Air Council may be exercised and performed by any three of their number, and notwithstanding that any office, the holder of which is a member of the Air Council, is temporarily vacant, provided however that documents may be signed on behalf of the Air Council by any two members of the Air Council.

(6) This Order in Council shall be substituted for the Orders in Council, dated 21st day of December, 1917, the 2nd day of January, 1918, the 4th day of March, 1918, and the 11th day of May, 1918.

Almeric FitzRoy.

The Grain Dinner.

The second annual reunion dinner for past and present officers of Grain Air Station will be held on Saturday, Nov. 6th at the Hotel Jules, Jermyn Street, S.W.

Will all ex-Grain officers who desire to attend communicate as early as possible with the organising secretary, Capt. L. A. T. Pritchard, at Foxhill House, Sutton Coldfield.

The price of tickets is 16s. (exclusive of wines); dress, uniforms or dinner jackets.

Engine Repair Shops (France) Dinner.

The First Annual Reunion Dinner of the Engine Repair Shops Association, the President of which is Wing-Commander G. B. Hynes, D.S.O., is being held on Friday, November 12th, at the Holborn Restaurant, London. Full particulars may be obtained from Flying Officer D. Drover, Directorate of Research, Room A.243, Air Ministry.

The Redcar Reunions.

It is suggested that those "Redcarites" who intend visiting the Motor Show to be held at Olympia this November should endeavour to visit the Show on Wednesday, 10th, or Thursday, 11th, November, and be near the Bandstand between 18.30 and 19.00.

The second annual reunion dinner will be held on Saturday, November 13th, at the Imperial Hotel (Club Room), Russell Square, at 18.15 for 18.45, morning dress. Tickets can be obtained from Walter E. Crozier, Esq., c/o Bank of Adelaide, 11, Leadenhall Street, E.C.3.

No. 8 Naval Squadron Dinner.

The second reunion dinner of No. 8 Naval Squadron (No. 208 R.A.F.) will be held at the Holborn Restaurant at 18.45 on Saturday, Nov. 20th. Any officers and other ranks who served with the Squadron and have not received an invitation are requested to communicate with Squadron Leader Bromet, H.Q. Coastal Area, 33, Tavistock Place, W.C.1.

CHINA.

Military Domination.

It would appear from accounts received that the military party in China is rapidly gaining complete mastery of the country. The following with regard to the aeroplanes order under the Handley Page and Vickers contracts is indicative of the situation.

The contracts under which these machines were ordered provided a scheme for the equipment of China for commercial aviation purposes and for the training of aviators, upon the condition that the machines and aircraft material should not be used for military purposes.

This condition was disregarded to some extent in the recent fighting, when some of the machines were used, but not to any great extent. The British Legation protested against this, partly to safeguard the British aviators, and also with regard to the violation of the written contract.

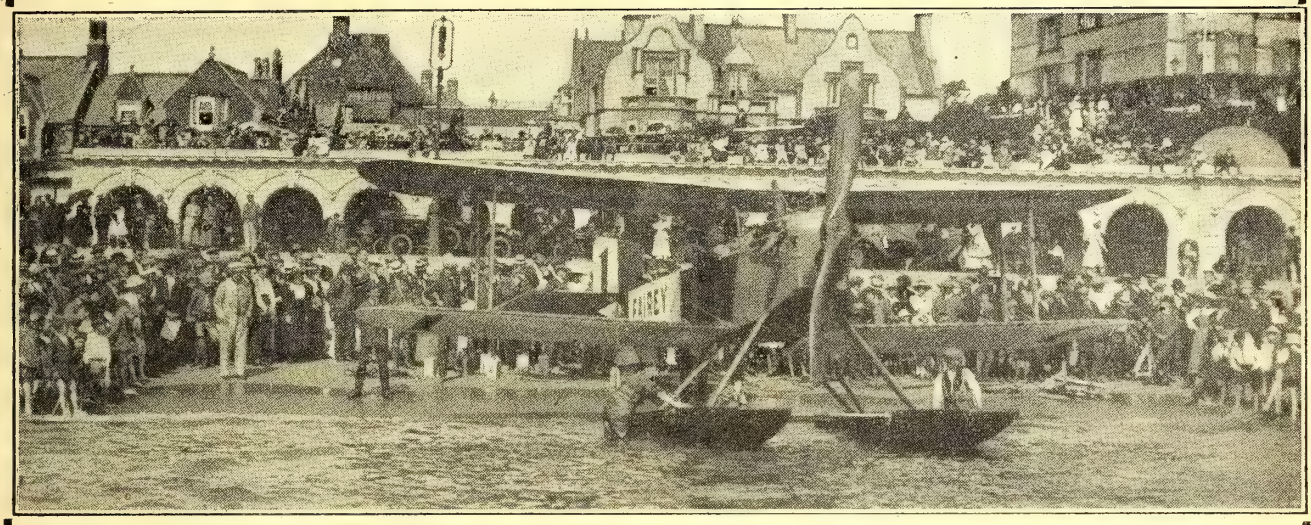
Later the General, Chang Tso-lin, gave orders that all the aircraft material at Pekin was to be transferred to Mukden and troops were quartered at the aerodrome barracks to enforce this. Some thirty aeroplanes are now being transported together with all the plant from the sheds, including the electric lighting plant.

LUTHUANIA.

An Air Raid.

It is reported from Vilkomir that a Polish aeroplane dropped two bombs on that town on Oct. 31st. Twenty-five people were killed and wounded, and two houses were destroyed.

AN OLD FRIEND IN A NEW GUISE.



Here the old familiar Fairey "N.10" Seaplane is seen at Bournemouth, arranged with a Napier "Lion" Engine of 450 h.p. and "Single-bay" wings as a racing machine in the Schneider Cup Race. This was the only occasion in an active career of nearly four years when she was flown with any but the original planes fitted when she was built at the beginning of 1917.

APRIL, 1917—OCTOBER, 1920.
AND STILL GOING STRONG.

THE QUESTION OF DEPRECIATION DOES NOT ARISE IN ESTIMATING RUNNING COSTS OF FAIREY AEROPLANES EITHER ON LAND OR SEA, IN SERVICE OR CIVIL AVIATION

THE HISTORY OF A SEAPLANE.

She was designed in 1916; She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet early in 1919; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact and under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness as a Seaplane in the Summer of 1920; She has survived Nine Different Engines. In September, 1920, She competed in the Air Ministry Competition for Amphibian Aeroplanes.

In all this work no Single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Unit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

The Fairey Aviation Co., Ltd.,

Head Office - - HAYES, MIDDLESEX.

London Office - - EMPIRE HOUSE, 175, PICCADILLY, W.1.
Works: HAYES, MIDDLESEX, & HAMBLE, near SOUTHAMPTON.

Telephones—19 Hayes, Middlesex.
394 Regent.

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THE FAMOUS BEARDMORE CARS now being introduced include, in addition to PLEASURE CARS, a special TAXI CAB complete with three-quarter Landaulette body and LIGHT DELIVERY VAN.

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AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

The greater part of this issue of *Aeronautical Engineering* is occupied by an article describing the actual experiences of the Laurentide Co., Ltd., of Grand'mère, Province of Quebec, Canada, in the use of flying boats for survey work, exploration, and forest patrol in country devoid of the ordinary transport facilities of civilisation.

This article is of very great interest as a narrative of useful work actually accomplished, and affords definite evidence of the practical value of aerial survey and transport work under the conditions encountered in the lumber trade.

But it has a larger value in that it serves to indicate the great possibilities of aircraft intelligently used for the exploitation of the waste places of the earth.

This particular lesson is dealt with in the article entitled "Aircraft in the Wilderness," which appears on this page.

Following upon the above-mentioned articles, which contain abundant evidence of the immense commercial value of aerial photography, the description of the latest types of aerial cameras developed by the Eastman Kodak Co. published on page 736 should have a special interest.

AIRCRAFT IN THE WILDERNESS.

The account given by Mr. Ellwood Wilson of the experience of the Laurentide Co., Ltd., with the use of flying boats for forest patrol and survey work in Canada, which is published in this issue, is of very great interest.

It is of very great direct interest purely as an account of useful commercial work carried out by aircraft under conditions of considerable difficulty, and it is of even greater interest as an indication of the very wide field which is open to the Aircraft Industry for exploitation and exploration.

The Handicap of High Speed.

It is just possible that the extraordinarily high speeds which have been attained by aircraft within so short a period of development, have in actual fact retarded the commercial development of aerial transport. Given the fact that the aeroplane can—and does—beat the train by several hours on such journeys as from London to Paris, it is probably inevitable that attempts should forthwith be made to use it for the carriage of passengers and express mails on routes where there already exists a large volume of high speed traffic carried by the older forms of transport.

And aircraft having undertaken work on such routes, it is inevitable that in the public mind the success or failure of aircraft for commercial work should be judged by a comparison of the safety, the reliability, and the cost of such services with the similar attributes of the most highly developed of the existing modes of transport. That such aerial services, while yet in their teething stage, can make even a show of competing under these conditions is in itself extraordinary.

Trade Follows Transport Facilities.

It is not sufficiently generally realised that the highly organised transport facilities which exist between great business centres do not exist because the great business centres are where they are, but that the great business centres are where they are because of the transport facilities offered by their particular localities.

The great trading centres of antiquity were practically all of them on the banks of navigable streams, or at the intersection of a number of caravan routes naturally settled by the absence of serious physical obstacles upon them.

That those great trading centres in very many cases still exist as such can be traced to the fact that a river, even it it be too small for modern shipping, often provides—in its valley—the physical qualities which render simple the construction of roads and railways.

The existence of such a trading centre in a position easily accessible to a railroad, for instance, naturally induces the building of that railway to it, but that in no way detracts from the fact that business centres owe their existence to the natural transport facilities afforded by their position, and not conversely.

London, for instance, originally owed its position to the presence of the Thames. The fact that regarded as a harbour for seagoing ships, or as a highway for inland water transport, the Thames to-day affords relatively poor facilities, has not detracted from the importance of London, because the physical features of the country surrounding London have permitted the construction of an immense network of roads, of railways and of canals radiating from that city in all directions.

Why Wildernesses Exist.

A map of the world showing the distribution of population indicates that there are vast tracts of the surface very sparsely populated, and that of these vast tracts many are far from being desert or uninhabitable. They merely possess no decent transport facilities. Many of these tracts are, in fact, known to contain natural resources of the greatest value.

These resources are unexploited simply because lack of communications renders it impossible accurately to explore the territories and to determine the distribution of the natural wealth which they contain.

Until such exploration is reasonably complete it is obviously impossible to build roads, railways or canals blindfold—into, say, the forests of Amazonia—in the hope that they will return a paying revenue. For, although the exact location of trading centres is determined by transport facilities, their very existence is conditioned by the existence of tradeable merchandise in the surrounding districts.

And How They May Be Abolished.

Mr. Wilson's article shows in the clearest and most convincing manner how aircraft may serve for the accurate and rapid and cheap survey of otherwise inaccessible districts, and thus reveal the resources to be exploited.

It shows also how they may serve as a rapid means of transport in such districts during the period before the building of roads and railways into it, and how they may serve to lighten the preliminary work of surveying the route for such normal methods of transport when the time is ripe for their construction.

Aircraft, in fact, may now act as the initial means of transport which will lead to the preliminary development of some of the great trading centres of the future.

And be it remembered that in this work there is no reliable, cheap, safe and comfortable competitor to set the pace to the air transport service. That one cannot fly to-day because of weather matters little if one can fly to-morrow—and in one hour complete a journey which will otherwise take a week.

A £50 charge for a 200 mile trip may be very cheap if the alternative is a fortnight's journey through jungles and marshes, and given reasonable care the risk of a crash is a small one compared to the possible dangers of such a journey.

And—a cruising speed of 80 m.p.h., or even less, will suffice instead of the 120 m.p.h. called for in competition with main line railways.

It is not suggested that such services as the London-Paris air lines should be abandoned in order to develop aerial transport in the waste places of the earth, but it is suggested that

a much more intense effort should be made to develop the use of aerial transport in such backward parts of the earth.

This suggestion is made partly because such territories afford a field free from competition wherein profits may certainly be made if the enterprise be but intelligently managed. but much more because they offer a proving ground whereon aircraft themselves may be developed into sound reliable commercial carriers.

How the Wilderness can Help the Aeroplane.

For instance, it will be noted in Mr. Ellwood's article that the average cruising speed of the flying boats used by the Laurentide Co. is 60 m.p.h., and that the saving of time effected over other means of transport is so great that a speed of 120 m.p.h. would make little difference in the total saving.

It will also be noted that reference is made to the heavy fuel consumption of the petrol engines actually in use, and the consequent high operating costs.

Now it is also obvious that such work as he describes could be carried out by engines of a considerably greater weight per h.p. than could be tolerated on an express mail service at 120 m.p.h., if those heavier engines were either much more economical, or used a much cheaper fuel.

The main difficulty to be overcome in the development of heavy oil burning aero engines of the self-igniting—or Diesel type—is precisely that of engine weight, and the development of commercial air transport under conditions where a speed of 60 m.p.h. will suffice greatly increases the permissible limits for that weight, and provides a more direct incentive to the development of such engines.

Once they are developed sufficiently for such services those services will provide the practical experience of their operation, which will conduce to their further improvement and development.

The very fact that the aeroplane and the airship are unfettered in their movements by many of the physical obstacles which prevent or greatly hinder the development of surface transport automatically provides certain fields for their use where they are free from competition.

Is it not prudent rather to use these non-competitive fields as nurseries, wherein aerial transport may develop freely to maturity, than to force it to compete—while it is yet in its infancy—only with the best and most highly organised of existing transport lines?—W. H. S.

THE USE OF AIRCRAFT IN FORESTRY AND LOGGING.

By ELLWOOD WILSON, Chief Forester, The Laurentide Co., Ltd.

In the spring of 1919 the writer proposed, for the second time, to the Directors of the St. Maurice Forest Protective Association, the use of aircraft for forest fire patrol, and asked the Department of Naval Affairs for the loan of two seaplanes, from a number of Curtiss HS2L boats which had been turned over to the Canadian Government by the United States Navy.

After some negotiation a contract was signed between the Department and the Association, and the two planes were flown from Halifax to Grand'Mere by Lieut. Stuart Graham, who had been engaged as a pilot. This trip was in itself quite a feat and, at that time, was the longest overland flight made by seaplanes in Canada.

The First Experiments with Forest Patrol.

The machines arrived at Grand'Mere on June 29th and commenced patrol work, but the fire season was practically over, only three or four fires being reported after that date, and of these the planes saw all. When it was realised that there was very little to be done in the way of fire patrol, an effort was made to get an aerial camera, but owing to strikes and other difficulties this was not obtained until September, and from then till Nov. 1st about four hundred photographs were taken.

In addition to this, officials of various companies, officials of the Commission of Conservation, and others were taken for trips, and several reconnaissance trips over timbered areas were made.

The results of the work were not satisfactory to the Fire Protective Association, which decided that the cost of using the planes for patrol alone was too high, and that the carrying of passengers and taking of photographs was outside of its regular line of work. However, the Laurentide Co., Ltd., had been so well satisfied with the work that it requested the Association to turn over the machines to them, and this, with the consent of the Department of Naval Affairs, was done.

The Results of Two Seasons' Work.

The writer has been in charge of the aerial work for two seasons, and gives herewith the results of the work.

The first season showed absolutely the practicability of the planes for reconnaissance of unmapped or mapped areas, for transportation of passengers and of fire-fighting equipment, for looking over the work of log drives, for spotting forest fires and for aerial photography.

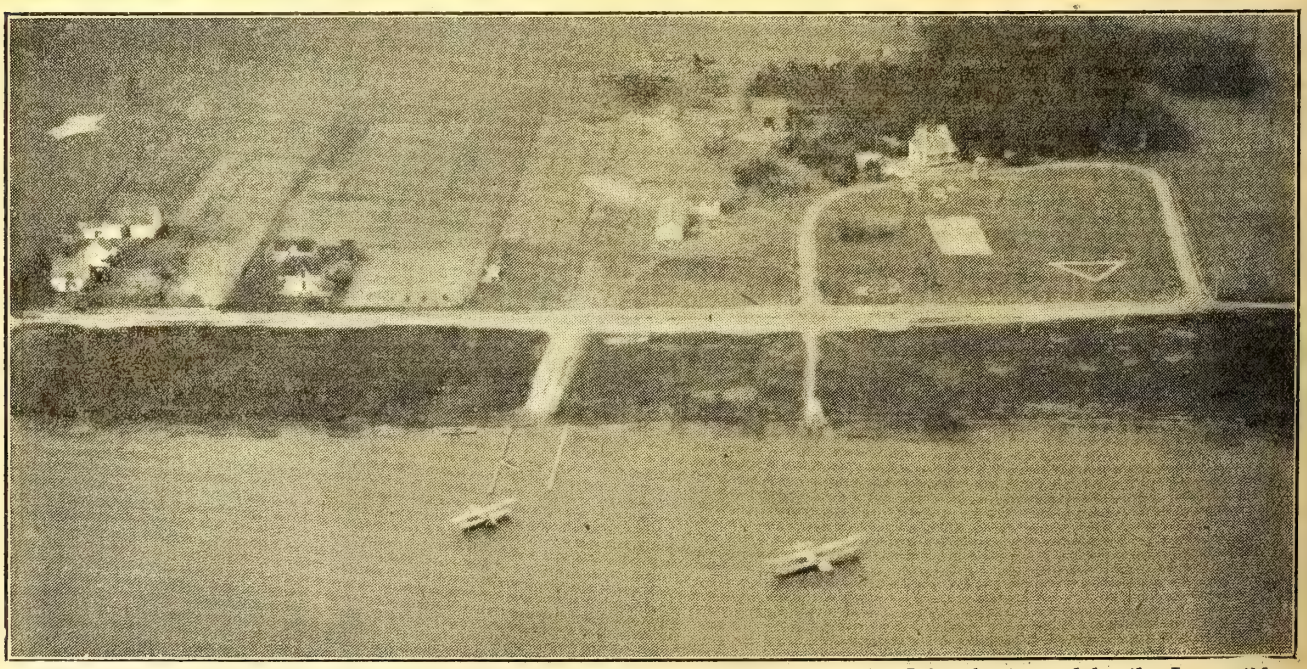
The winter was spent in overhauling planes and engines and in the study of pictures, taken from the air, on the ground. This spring a photographic laboratory was equipped so that photographs could be handled well and expeditiously.

The work commenced on May 17th and has been continued regularly to date, the appended table giving the amount of work done :—

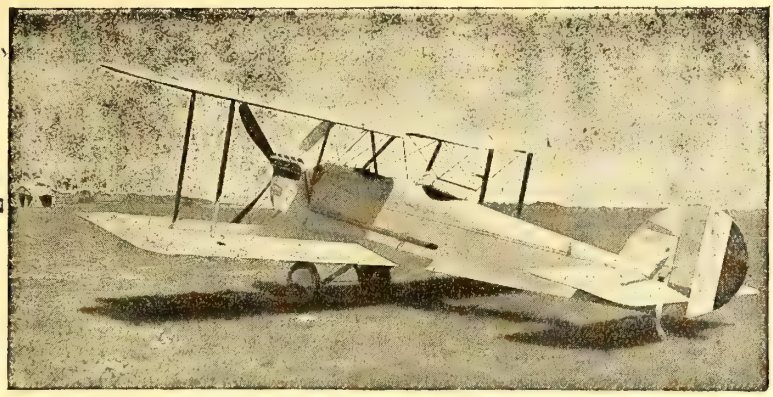
Miles flown	6,006
Hours flown	101
Photos taken	3,000
Acres photographed	543,100
Fires spotted	34
Passengers carried	23

Details of Work Done.

The longest flight from the base was 250 miles out. In the course of the work done above, many things of different sorts were accomplished. A flight of forty-four miles was made to stake out a mining claim. The plane carried four people, two



LAURENTIDE AIR STATION FROM THE AIR.—In the foreground are two of the flying boats used by the Laurentide Company for forest patrol and survey work.



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AN AEROPLANE WHICH YOU CAN PURCHASE AS EASILY AS IF YOU WERE BUYING A CAR.

In this P.9 Machine we have, we feel, solved the problem of providing an Aeroplane which is a sound business proposition—and which combines with low cost the great essentials for Commercial and Private use. All our great resources of material and craftsmanship have been utilised. Scientific Research and Experiment by a staff associated with flying from its beginnings coupled with the great Experience gained through the building of thousands of Aeroplanes during the War, have been concentrated in the production of this P.9 Model.

It is a Two-Seater—Single Engine Tractor—which has attained on test a speed of over 100 miles per hour.

Its outstanding features are :—

CHEAP AND EASILY HOUSED The Initial cost is extremely low, and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size it is easy to handle on the ground and requires but little accommodation. The principal dimensions are : Span, 27 ft. 6 in.; Length, 25 ft.; Height, 10 ft.

EASY TO FLY. The P.9 has a very large speed range—enabling it to be landed in an extremely small area with ease. The well-balanced controls and excellent stability allow the machine to be flown for long periods without undue fatigue to the pilot.

COMFORT AND CONVENIENCE. The comfort of the Pilot and Passenger has been specially considered. Each Cockpit is roomy and fitted with our special seats. Controls for both Flying and Engine are fitted in the front and rear Cockpits to enable the machine to be flown from either position. The exhaust from engine is discharged behind the rear Cockpit giving a silencing effect and freedom from fumes. Two standard cases are provided for luggage and form part of the fairing immediately behind the rear Cockpit.

The uses to which this compact and efficient machine can be put are wide and various, and will suggest themselves to those who have been awaiting the stage of Aeronautical Development now reached by the P.9. It can be used for dozens of Commercial Purposes. The same type carried photos from R.34 direct to London. It has been sent to Australia for Sheep-runs—and will soon be in use in various parts of the world for Exploring Uncharted Territory, Examining Timber Tracts, Fighting Forest Fires, Carrying Mails to Distant Mines, Transition of Colonial Mails to Mail Steamers, and for General Patrolling and Police Purposes.

If you are interested—write for full particulars and prices. State your needs or purpose, and our engineers will consider every detail closely—to advise soundly.

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tents, folding canoe, provisions and instruments. The party stayed out two nights and much time was saved, as, in the ordinary course of events, it would have taken two days' travel each way by canoe, and with the plane it took less than an hour.

Aerial Surveying.

A boundary survey of some limits had to be made, and the starting point was difficult to locate, as, if all the work were to be done on the ground, 22 miles of chaining through the woods would be necessary to locate an intersection from which to commence. The plane was sent up, and the three sides of the triangle necessary to locate the intersection were photographed in one day, and the course the new line would have to follow was also photographed, showing all the lakes, streams and hills which the line would cross.

On two sides of the triangle, where lines already existed, they were visible in the photographs at numerous places on the ground and could easily be joined up. Thus all of the field work was practically checked up before beginning the work, which can now be planned with great exactness. It is proposed to put provisions on the lakes, which the line will cross, ahead of the party, so that they will only have to carry enough to last for a short time and save heavy portaging through the woods.

Exploring Unmapped Territory.

Explorers were taken over territory which was offered for sale, and of which there were no maps. The observer sketched in the burns, timbered areas and other information, and at the same time got a very good idea of the country as a whole. Then taking his sketch map he went in on the ground and estimated the timbered areas, saving much time which would have been wasted in locating the burnt areas. In one trip a reconnaissance of about four hundred square miles was made.

The Logging Manager made several trips of this kind, and with his sketch maps and his bird's-eye view of the country was able to lay out and direct the work of his explorers. Several flights were made to note the progress of drives, and it was very easy to see just how the work was progressing, and whether the streams were being swept clean or not. In one case a large number of rollways of logs which had been left in the woods the previous season were discovered and photographed.

Trips were also made to look over and estimate the number of logs in the sorting booms, so that the time and number of men required to saw, so as to finish before the winter, could be determined. The Logging Manager and his Superintendents were taken to and from distant points of their work and much valuable time saved.

Aerial Land Valuing.

One of the most valuable parts of the work was the photography of lands which are to be purchased for planting. A complete dictionary of these lands was made, and as the photographs give every detail it is of great value. Lot lines, buildings, fences, ditches, roads, all show plainly, and the areas of different kinds of land also. Even the character of the soil can be seen.

The areas in cleared land, swamp, burn, scrub timber and good timber can be easily measured with a planimeter, and the exact value of the land determined. A scale of prices for the different kinds and qualities of land is determined, and all lands are bought by it. The seller and the purchaser can sit down over an aerial photograph and make a trade much better than in any other way, for they have all the details before them.

Planning Work.

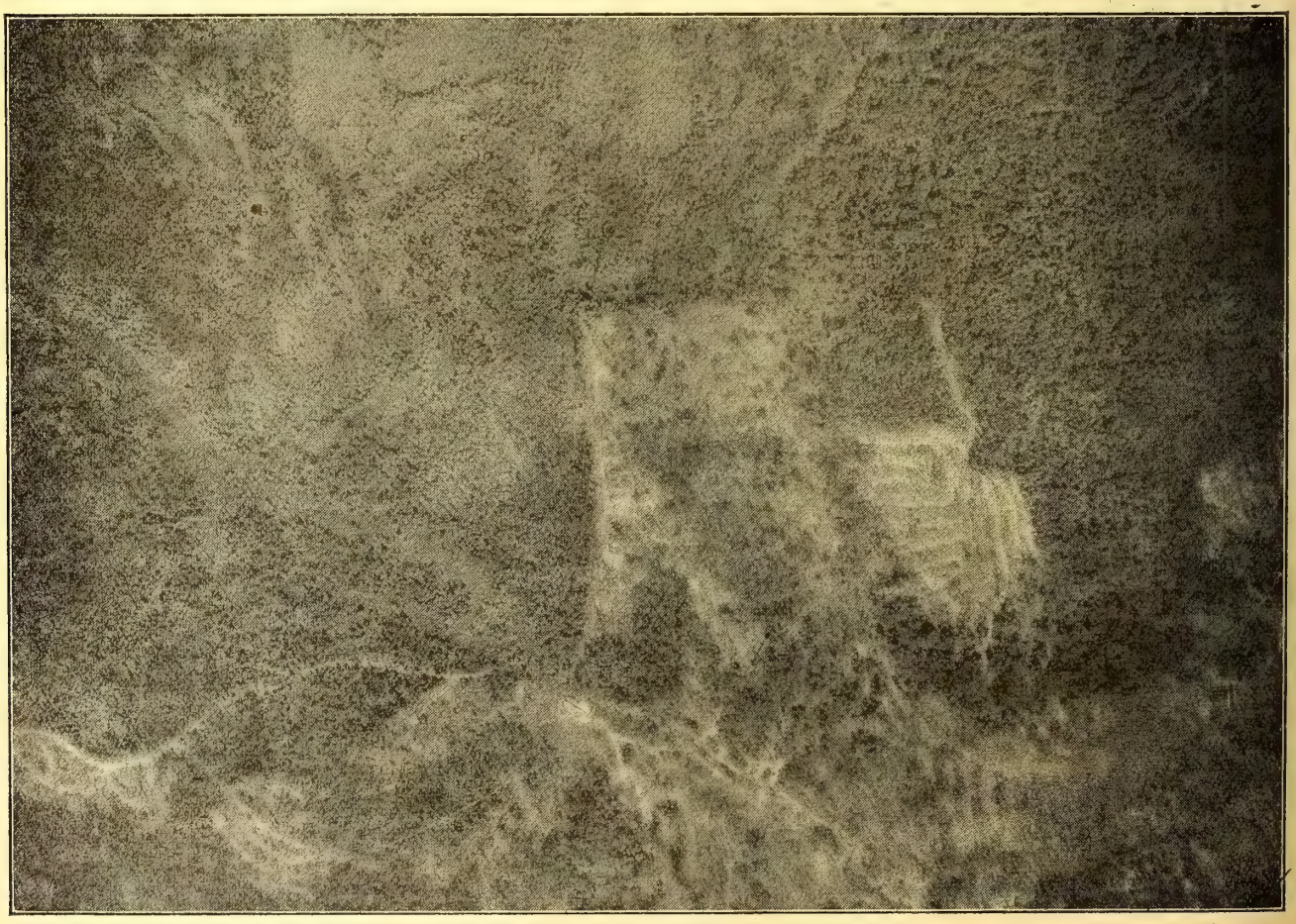
In planning all kinds of engineering work, laying out roads, ditches for drainage, areas to be planted, and so forth, the photographs are of the greatest assistance, and by taking a series the progress of the work can be checked very much more rapidly than by ground measurements. The areas cut over in a logging operation can be checked, the roads can be seen, areas left uncut can be determined, and the general efficiency of the work judged.

The general results from the work promise well, and the Laurentide Company has decided to make aerial work part of its operations. Permanent hangars are being built, together with houses for the personnel and shops for the care of repair work.

The Cost.

The cost of the work, as carried on experimentally, has not been excessive, and as it becomes standardised can be materially reduced. The main thing is to have the machines in the air as much as is possible, so as to cut down the unit costs of the work. The cost per mile works out at about $3, and the cost of photographing at about 2.6 cents per acre.

This is based on the use of the HS2L seaplanes, which use about 25 gallons of petrol per hour and are slow climbers. Also there are many items of expense incidental to beginning the work which will be eliminated later when more experience has been gained.



AN AERIAL VIEW OF A CANADIAN FOREST.—The prog ress of timber-cutting operations can be clearly seen from the thinning out of the trees where work is in progress.

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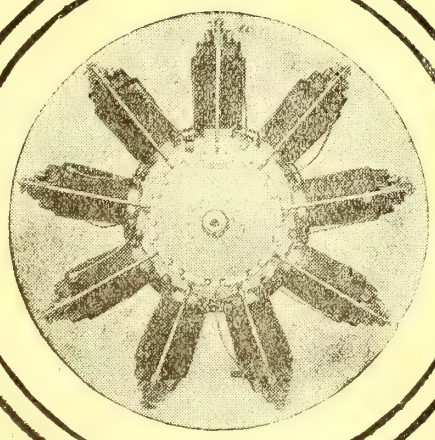

The Engine illustrated is the DRAGONFLY—340 h.p.—9 cyl. (Static Radial).

WALTON MOTORS, Ltd,
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The Saving of Time.

To sum up the results so far obtained: For carrying men, whose time is valuable, to distant parts of the work, the planes are most useful. The manager of a company with large wood interests gets tied down to his office and mill work, and a trip into the woods consumes so much time that he does not like to take it. The same is becoming increasingly true of logging managers and superintendents.

They do not like the hardships of long journeys into the woods and the being out of touch with their general work for days at a time.

With the seaplanes the most distant operations can be visited and the work inspected with only one night away from home. Local foremen in the woods will be kept up to their work much better. In case of accident doctors can be rapidly taken into the woods and injured men brought out. Mail can be taken in and reports brought out much oftener.

Days Instead of Weeks.

For rapid reconnaissance the planes are invaluable. Tracts which are for sale can be inspected in days, where weeks were required, and the information obtained is much more accurate and full than ground work. In a few hours in the air the general drainage of a country can be determined, burns, swamps and timbered areas sketched in, the species present noted, and the general character and quality of the timber ascertained.

Windfalls and insect damage can be seen, and all areas estimated with more accuracy than from a strip survey. When the ocular survey is supplemented with photographs there is no room for doubt about the character of the country, and instead of depending on the opinion of the man who has made the reconnaissance all the responsible men interested can get together and discuss a purchase or a proposed operation intelligently and with the information before them.

Spotting forest fires and taking help to extinguish them is a valuable part of the work.

Provisioning Distant Camps.

The carrying of provisions to distant operations will certainly become a part of the work before long, doing away with the building of expensive tote roads, and making possible the placing of provisions just before the work begins, instead of taking them in the previous winter, thus doing away with spoilage and the cost of insurance and the labour necessary to watch them.

Then, too, it will not be necessary to build large depots from which, oftentimes, quite long hauls to separate camps must be made, but provisions and gear can be put right down at each camp.

In the purchase of lands for other than logging purposes aerial photographs are invaluable, giving, as they do, *all* the information required.

The Importance of the Camera.

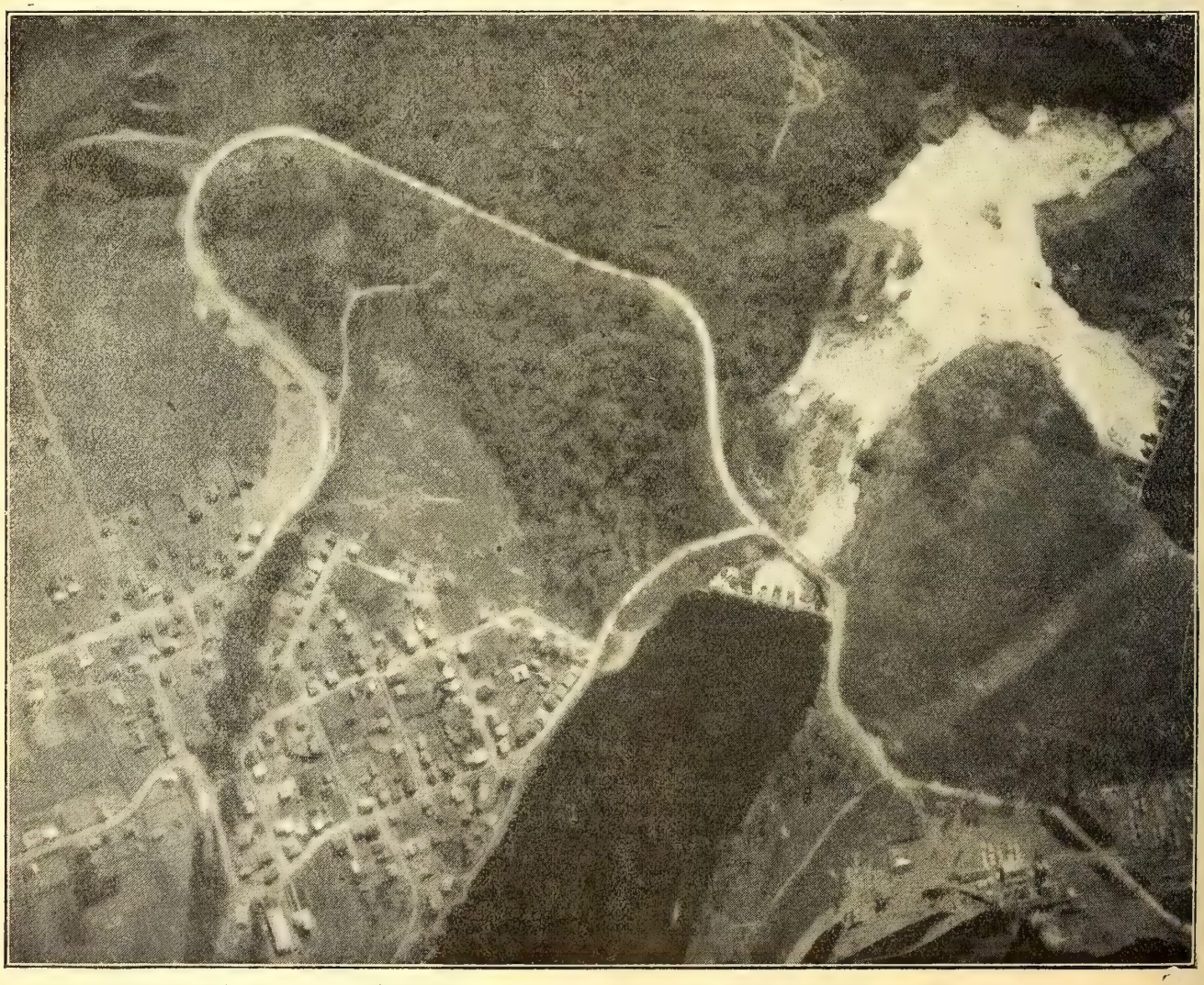
The aerial camera is going to be more and more indispensable. So far as our studies have gone, the types of timber and land can be accurately determined. The actual number of trees in the ground covered can be determined, and a fair idea of the general size of the stand obtained.

For forest maps photographs are far better than ground surveys, giving all the information needed rapidly and accurately and in a form which everyone can easily learn to understand. Instead of the information being stored up in a man's head or in his notes, which are often coloured by his personal idiosyncrasy, it is always available and leaves no room for varying opinions.

The technique of reading these pictures and of making estimates from them is being carefully and thoroughly studied, and a regular dictionary is being built up. Much ground work will be carried out this winter, especially in the estimation of quantities from the photographs.

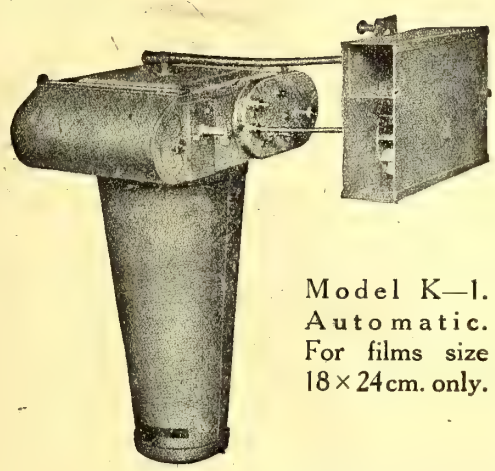
Some General Conclusions.

The following general conclusions can be drawn from the experience gained thus far. For work in country where there are many lakes the flying-boat is the best type of machine. The float type has not proved satisfactory, as the floats are very fragile and easily become waterlogged. The flying-boat is structurally strong and rugged and will stand much harder usage. It presents a fairly stable platform for a camera. The type we are using is ideal from every point of view except cost



THE SHAWINAGAN FALLS.—Photographed from one of the Laurentide Company's flying-boats.

Aerial Photography



Model K—1. Automatic. For films size 18 × 24 cm. only.

Aero-cameras, both hand and automatic, for plates or films; also materials and accessories of every description for aerial photography.

Write for full particulars to

Kodak Ltd. (Wratten Div.), Kingsway, London, W.C. 2.

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F.C.N. 5.

FIRTH'S 5% NICKEL CASE-HARDENING STEEL.

Equivalent to Air Ministry Specification S.17. Engineering Standard Specification No. 75, "5% Nickel Case-hardening Steel."

THIS STEEL IS SPECIALLY RECOMMENDED FOR HIGHLY STRESSED PARTS WHICH ARE SUBJECTED TO ABRASION, SUCH AS GEAR WHEELS, CAMSHAFTS, ETC.

ITS ESPECIALLY TOUGH CORE ENABLES IT TO STAND UP TO HIGH PRESSURES WITHOUT FLAKING OF THE CASE.

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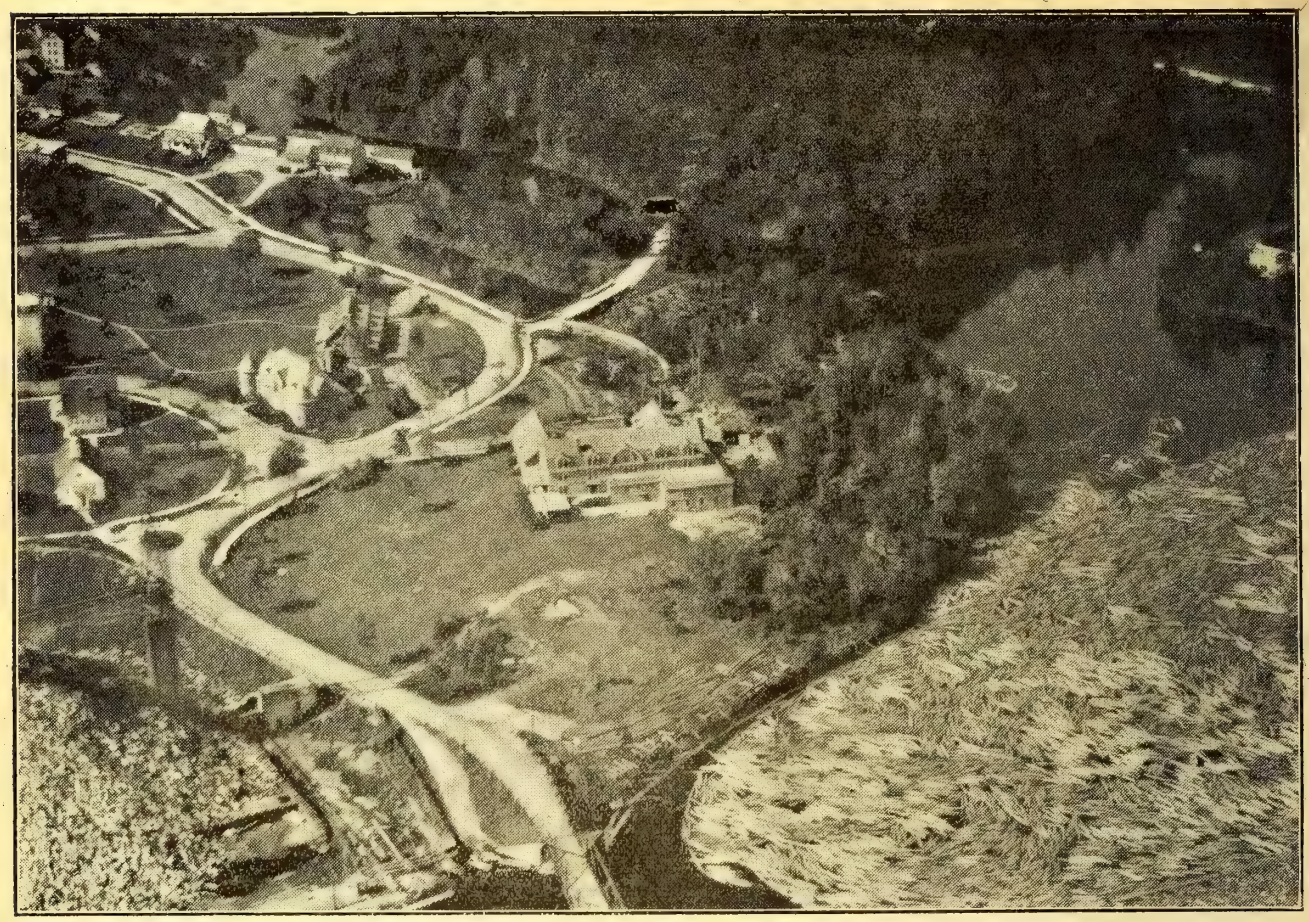
SHEFFIELD



THE LAURENTIDE HOTEL AND CLUB BUILDINGS.—Photographed from one of the Laurentide Company's flying-boats. Note the lumber in the right-hand bottom corner.

of operation, and we have purchased a Curtiss "Sea Gull" for patrol work, passenger carrying and photography. The larger machines will be used for carrying provisions, large parties and fire-fighting apparatus.

The Question of Personnel.

The personnel of a flying station is a matter of great importance. Experienced pilots are necessary, and the fact that men have wide experience in flying land machines does not always qualify them for seaplane work. Only the highest type of men should be employed, whether as pilots, mechanics, or riggers, as men of a lower type are likely to have a lower sense of the responsibility and importance of their work. Men who are reckless or who drink should never be employed.

Rigid inspections before flights are absolutely essential, and no machine should ever go up if there is the slightest doubt about it being in perfect flying condition. The amounts invested are large and the loss of a machine is a serious matter, even leaving out of account the risk to the personnel.

Small Airship Possibilities.

The development of the "Pony Blimp," or small dirigible, opens up a new line of development which is very promising. With a speed of 45 miles per hour and a wide cruising radius, it uses only three gallons of petrol per hour and has a greater carrying capacity than a plane. As it can be stopped in the air at almost any altitude, it offers an ideal means of timber cruising and mapping and for carrying fire-fighters and equipmen, and also supplies for survey parties and logging camps.

If the risk of fire is not great and the cost of plant for charging with gas not too expensive, it will be an ideal adjunct to forestry and logging work. It will also do away with what, in the north-eastern part of the continent, is a great drawback to aerial work, the inability to fly in winter. It may be that we shall be able to make winter flying practical, but so far it is out of the question with planes on account of the low temperatures and deep snows which we have in eastern Canada.

I feel that aerial transportation and photography have come to stay, and that with careful, well thought out development, will prove invaluable in the management and exploitation of large timber holdings. We are constantly trying to study out new ideas for the planes and the camera and are sure that their field of usefulness will become ever larger and more important.

THE EASTMAN AERIAL CAMERAS.

The Model K.1 Automatic Film Camera.

The Eastman-Kodak Topographic camera has been specially designed for the purpose of photographic mapping, and has embodied in it all the improvements and modifications suggested by past experience in aerial photography and also many interesting features whose functions are to render the camera simple to operate and entirely foolproof in operation.

The camera consists of three components—the lens cone, the film box and the wind motor. It is entirely automatic in its action, any number of exposures, within the limitations of a hundred exposure Eastman-Kodak Daylight Loading Orthochromatic Aero film 7 1/16th by 9½ (18 by 24 cm.), being made by the simple manipulation of the lever controlling the wind motor.

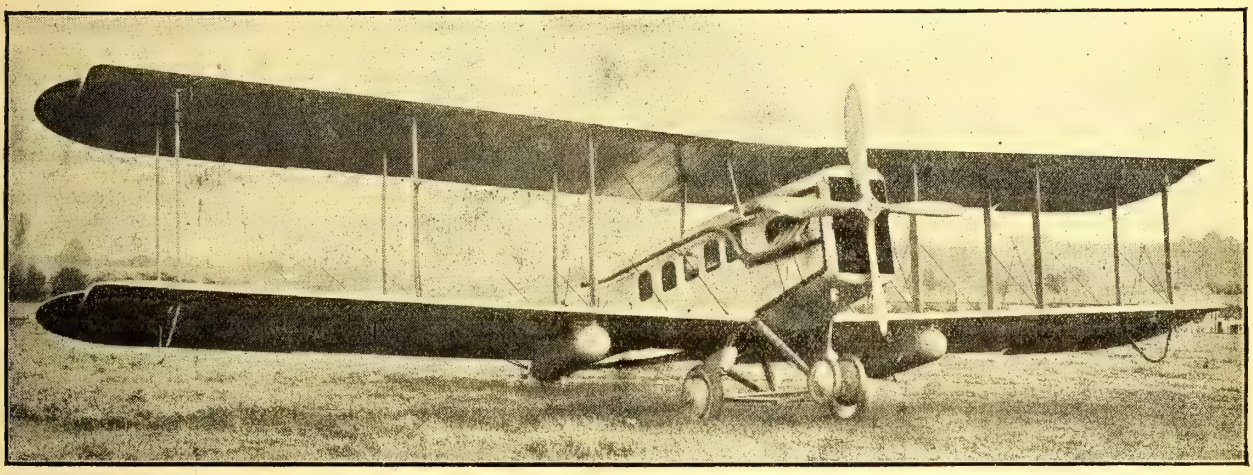
The speed of the focal plane shutter and the interval between exposures, to ensure sufficient overlap, are easily adjusted to meet the variation in altitude of the aircraft, the speed of flight and the effects of vibration on the sharpness of the photograph.

The lens cone is an elongated metal cone, the larger and upper end of which is attached to the film box by a quick release device. The lens fitted can either be a 12 in. or a 20 in. lens, which is carefully adjusted and rigidly set at infinity, provision being made for readjustment of the focus should it be necessary.

The film box is in an enlarged form much like the main body of any Kodak folding film camera, and has semicircular receptacles at either end to take the two film spools. One spool carries the roll of unexposed film, and the film passes over the upper side of the box and the focal plane shutter, and after being exposed on to the spool at the opposite end of the box.

The upper side of the box has a removable door. The inner side of this door consists of a perforated platen, which is connected up by means of a suction head to a Venturi tube carried in the upper portion of the wind motor box. As the film is automatically drawn across the recording plane it is held in close contact with this platen by the air suction, and there is no possibility of deformation of the film by vibration. In order to guard against excessive suction on

WESTLAND



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have been awarded the FIRST PRIZE of
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WESTLAND SIX-SEATER LIMOUSINE

fitted with the 450 B.H.P. NAPIER LION Engine.

FACTS FROM OFFICIAL RESULTS.

(1) **FASTEST TOP SPEED.**
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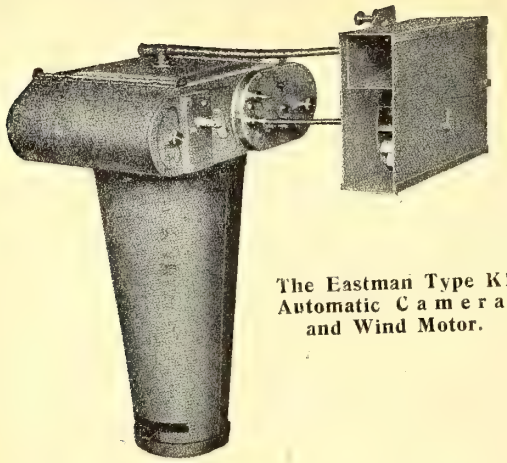
(3) **BEST ECONOMY:—**
Lowest Fuel cost per pound useful load.
Lowest Oil Consumption irrespective of B.H.P.
(4) **RELIABILITY.**

The result of the Competition is to stamp the WESTLAND LIMOUSINE with the hall mark of excellence for Aerial Transport. We invite enquiries for these machines, and are prepared to grant licences for manufacture abroad.



The Eastman Type K1 Automatic Camera and Wind Motor.

the film, the suction head is provided with a valve which automatically opens as the suction increases beyond the point required to hold the film flat.

The platen is specially constructed to overcome static electrical effects set up by undue friction between the film and the vacuum back. Electricity, generated as the film is drawn from the roll, is collected by a brush partially encircling and in contact with the roll of unexposed film.

A Graflex Focal Plane shutter, having a one-piece curtain with a metal-bound fixed aperture, ¾ in. wide, operates as closely as possible to the focal plane and permits the lens to work at its highest efficiency throughout the period of exposure. The speed of the exposure, or the rapidity with which the aperture of the curtain passes across the recording plane, is regulated by adjusting the tension of the curtain by means of a key, the tension number indicating the required speed being shown at an aperture directly underneath the key. The tension numbers run from 1 to 12, giving a range of speed from 1/90th to 1/310th of a second.

At the bottom aperture of the film box is a safety curtain, which is normally closed. This curtain is automatically opened after the shutter has been set, and closes after it has been released to make an exposure, thus allowing the shutter to be reset and the film to be wound into position for the next exposure. At the point where the shutter, in turn, closes the recording plane, the safety curtain is quickly drawn back ready for the next exposure.

By means of a train of gears operated by flexible drive from the wind motor, the film is wound into position, the focal plane shutter is set, the safety curtain is withdrawn, and the exposure made. At the end of this cycle, the safety curtain closes and permits the film and shutter to be reset. Two flexible drive terminals are provided, the slow terminal having a speed of 600 revolutions for every cycle of operation of the camera, and the fast terminal a speed of 300 revolutions.

The whole of the camera is of metal construction, which considerably lessens the possibility of distortion due to variation of altitude.

The wind motor, which is intended to be fixed to the side of the fuselage in the slipstream of the propeller, consists of a metal box, the lower half of which consists of a rotary paddle-wheel, connected by means of flexible drive to either of the two terminals in the gearbox. The upper half carries the Venturi tube, which is connected to the suction head in the perforated platen by rubber tubing. On the inner side of the wind motor, in a position convenient for the pilot or observer, is a control lever which operates a damper behind the rotary paddle-wheel and thereby controls the passage of air through the motor tunnel.

It will, therefore, be seen that the interval between exposures and the overlap in the pictures is controlled by four variable factors—altitude of flight, ground speed of the aircraft, speed of the wind motor, and the speed of the driving terminal on the camera.

Provision is made, by a key in the side of the gearbox, whereby single photographs may be taken in the air, six and a half revolutions of this key immediately after the shutter has been released, making one complete cycle of operation. Alternatively, it can be used to permit inspection of the camera on the ground, when it is disconnected from the power drive.

For aerial surveys, forestry, etc., the Kodak K.I. aerial camera is eminently suitable; large tracts of country being covered with the minimum of trouble, as after the air speed and height has been determined the only control necessary is the operation of the lever controlling the speed of the wind motor.

The Model K.1 camera, complete with 100 exposure film roll, weighs 44 lb.

The Type B.1 Hand-held Camera.

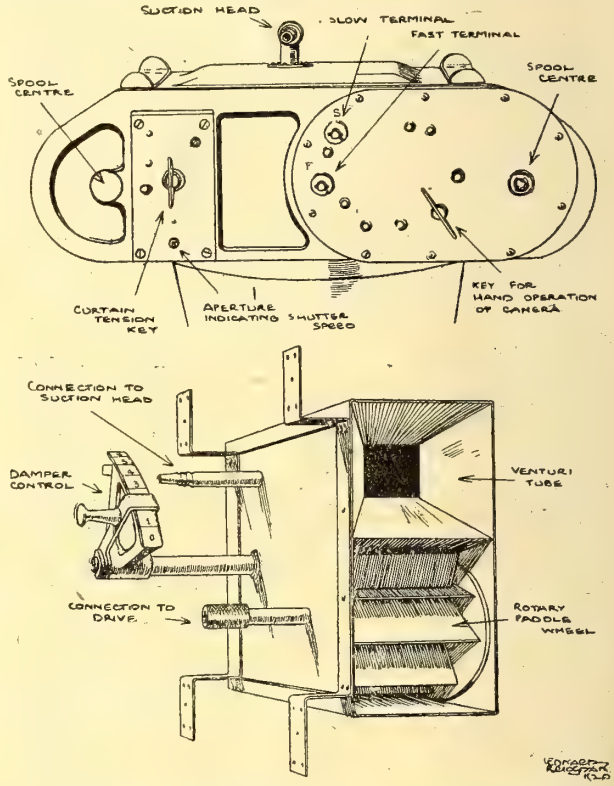
For less ambitious work a smaller camera, suitable for hand work, has been developed from the Model A.1 Kodak hand-held aero camera, which was used extensively by the U.S. Air Services. The new model, known as the B.1, is used for films only, but otherwise is very similar in general design to the A.1.

The chief difference in construction lies in the mechanism for rapidly changing the exposed film, the focal plane shutter, and the advantage of daylight loading is obtained. The small size of this model, its light weight (10 lb.), and the arrangement of the grips and thumb lever shutter release, gives a control that very successfully overcomes the effect of air pressure experienced with large type of hand-held cameras.

The camera is sighted, and a slight pressure upon the thumb lever release opens the safety shutter, exposing the lens, and makes the exposure. One short quick turn of a lever advances the film and resets the shutter. The B.1 takes a twelve exposure, 5 by 4 roll film, which is easily removed when exposed to give place to a fresh spool.

The advantage of films over plates in commercial aerial photography are many. Their light weight, small bulk, their "bending" qualities, ease of loading and unloading in daylight, storage, etc., place them in a sphere by themselves.

That the aerial camera will be used extensively for survey-work, etc., is a predetermined fact, but it is essential that a high-grade camera be used. An Eastman-Kodak aerial camera, produced with the experience gained from their wide knowledge of cameras in general, and particularly with their past experiments with various types of aerial cameras, should ensure their post-war products being of the highest quality.



Some details of the Eastman K1 Automatic Aerial Camera.

NOTICE TO GROUND ENGINEERS.

No. 12, 1920.—Avro 504 and 536 Type Machines.

Upper Shoe Fitting for Engine Diagonal Strut (Part 100).

It is hereby notified:—With reference to Notice to Ground Engineers No. 7 of Sept. 2nd, 1920, further investigation has revealed that the above-mentioned fitting has shown such signs of weakness that it cannot now be regarded as reliable from the point of view of the airworthiness of the aircraft.

Owners of all British registered aircraft concerned have therefore been notified that the certificates of airworthiness of the machines in question will be suspended unless the following action be taken:—

1. Close inspection of the fitting must be made forthwith.
2. In cases where the part is found to have weakened it must be replaced immediately, and before any further flying takes place, by a new fitting as shown on Drawing A.D.2988.
3. In cases where no sign of weakness has yet shown itself the above replacement need not be made for a period of 3 months from the date of this notice or until the aircraft requires overhaul, whichever is the shorter, provided that within a week of the date of this notice a reinforcing strap as shown on Drawing A.D.2996 is fitted over the existing fitting.

Ground Engineers are reminded that they cannot issue a Daily Certificate of fitness to fly in the case of aircraft for which a certificate of airworthiness has been suspended.

Air Ministry, Oct. 13th, 1920

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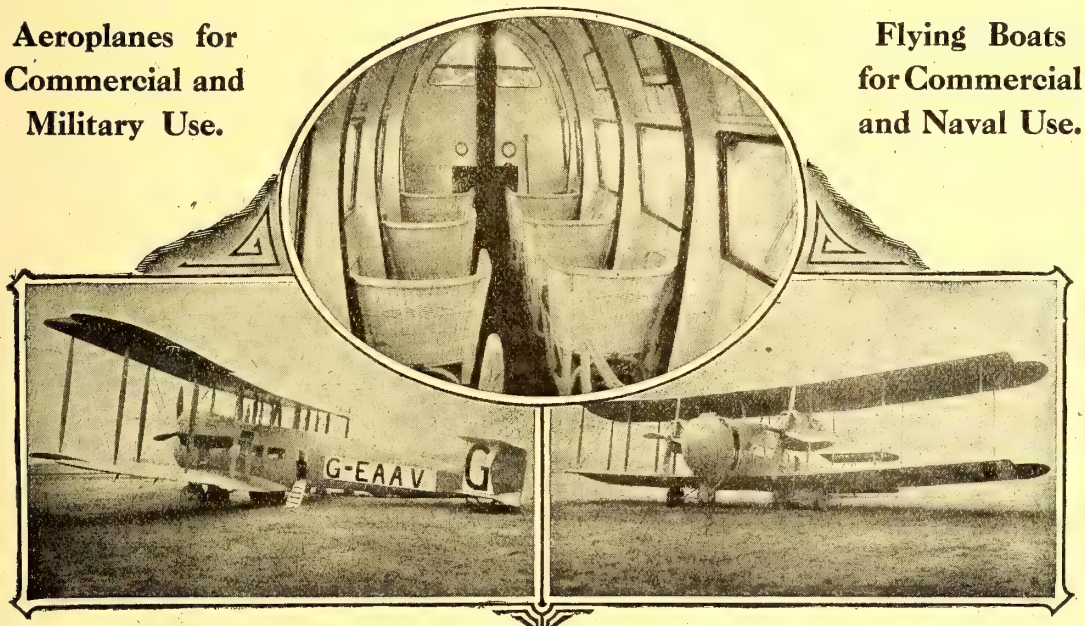

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THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

AIR MINISTRY.

NOTICE TO AIRMEN (No. 98 of the year 1920).

FRANCE: AERODROMES, CUSTOMS, AND WIRELESS STATIONS.

It is hereby notified:

Previous Notices to Airmen regarding Aerodromes, etc., in France are revised as follows:—

1. AERODROMES.

St. Inglevert (Lat. 50 deg. 53 min. 0 sec. N., Long. 1 deg. 44 min. 30 sec. E.), approximately 5 miles SSE. of Calais, was opened as a Customs Aerodrome on May 20th. (See Plan annexed.) Customs personnel are on duty during the day only. Petrol, oil and water supplies are available, and a handling party is stationed on the aerodrome. There are two hangars in the S.E. corner of the aerodrome No repairs can be carried out. A wind indicator is placed on the S.E. boundary of the aerodrome.

The area most suitable for landing is marked by white lines. The centre of the landing ground is marked by a white circle 132 ft. in diameter, and on the south side of the circle is the name "St. Inglevert," so placed as to be read from the south. A wind sleeve is placed on a 16 metre post near the hangars at the S.E. corner, and a landing "T" is situated near this.

The red or white flag required by the International Convention which indicates the anti-clockwise or clockwise circuit is hoisted on the post carrying the wind sleeve.

In case of fog, rockets are sent up to indicate the position of the ground and Bengal lights are lighted in the landing circle.

An aerial lighthouse has been installed outside the S.E. corner of the aerodrome, and is in operation every evening from sunset to 1½ hours after sunset. Its characteristic signal is the letter "A" of the Morse Code every 8 seconds, thus:—

White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 3.0 secs.
Eclipse, 4.0 secs.

There is a wireless station on the aerodrome with an aerial between two masts, one inside the boundary of the aerodrome near the hangars and the other outside near the Boulogne-Calais road.

Obstacle lights are fixed on all high obstacles.

LE BOURGET (Lat. 48 deg. 57 min. 0 sec. N., Long. 2 deg. 25 min. 0 sec. E.) is a French Customs Aerodrome situated about 7 miles N.E. of Paris. (See Plan annexed.) Petrol, oil and water, and hangars are available. A landing "T" is situated in the angle formed by the line of hangars and the offices of the aerodrome. Wind sleeves are fixed on the gables of the centre S.N.Ae. hangar and the workshop hangar. A red flag is hoisted on the offices of the aerodrome when the wind speed is greater than 4 metres per sec. (approx. 10 m.p.h.), in which case taking off and landing should take place upwind. The flag is lowered when the wind speed is less than 4 metres per sec., in which case taking off and landing should take place towards the north.

On the ground opposite the offices of the aerodrome there is a white "T" which indicates the zone to be used by machines before starting and after landing for taking up and setting down passengers or freight. The starting zone is to the south of the dividing line and the arrival zone is to the north of the line. The words "Arrival" and "Departure" are marked on the ground in white letters in French and English.

An aerial lighthouse, showing a white light, is installed on the south side of the aerodrome, and is in operation every evening from sunset to 1½ hours after sunset, and also by request when the arrival of machines is notified. Its characteristic signal is the letter "N" of the Morse Code every 8 seconds, thus:—

White light, 3.0 sec.
Eclipse, 0.5 sec.
White light, 0.5 sec.
Eclipse, 4.0 sec.

The aerodrome is also illuminated by a battery of searchlights, situated near the offices, which illuminate a landing run of about 800 yards.

There is a wireless telegraph station in the aerodrome, with an aerial on the eastern side. This obstacle is marked by fabric pennons during the day and a white light at night.

BORDEAUX (TEYNAC) (Lat. 44 deg. 50 min. 30 sec. N., Long. 0 deg. 42 min. 0 sec. W.) is a French Civil Aerodrome situated six miles west of Bordeaux. Petrol, oil and water, and hangar accommodation are available. A landing "T" is situated in the north corner of the ground. A wind sleeve is situated on the hangars near the north corner. Circuits of the aerodrome should in all cases be made in an anti-clockwise direction.

Night Landing Arrangements.—(1) Two white lights, 300 yards apart, are placed on the leeward side of the aerodrome, marking the leeward boundary of the landing and taking-off area. A third white light is placed on the windward boundary, making with the two leeward lights an isosceles triangle; a machine landing must pass over the two leeward lights, heading towards the windward light. When there is no wind the triangle of lights is placed in the position most favourable for machines landing.

(2) White lamps are placed on obstacles as follows:—Two on each Bessoneau hangar, one on each garage.

These landing lights are only exhibited when aircraft are expected.

Pilots intending to land at Bordeaux at night should therefore communicate direct with the Commandant, whose telegraphic address is:—

Commandant,
Aero Merignac,
Bordeaux.

It is not necessary to advise the Commandant beforehand when landing by day. There is a W/T station on the aerodrome with a wireless mast in the north corner.

LYONS (BRON) (Lat 45 deg. 44 min. 0 sec. N., Long 4 deg. 53 min. 0 sec. E.) is a Military and Civil Aerodrome, about two miles S.E. of Lyons.

Three wind sleeves are installed. Two of these sleeves are red, and are situated on the western side of the aerodrome; the third is white, and is situated on the eastern side of the aerodrome. When there is no wind machines should land and take-off from south to north.

An aerial lighthouse, showing a white light, is situated at the S.E. corner of the aerodrome, which is in operation each day from sunset to one hour after sunset. Its characteristic signal is the letter "H" of the Morse Code every 7½ seconds, thus:—

White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 0.5 sec.
Eclipse, 4.0 sec.

There is a wireless station on the aerodrome with a wireless mast in the S.E. corner.

Obstacle lights are fixed on all high obstacles.

VALENCIENNES (Lat. 50 deg. 20 min. 0 sec. N., Long. 3 deg. 31 min. 0 sec. E.) is an emergency landing ground, situated about 1½ miles south of the town of Valenciennes.

An aerial lighthouse, showing a white light, is established on the aerodrome at the N.E. corner of the ground, and is in operation every evening from sunset to one hour after sunset. Its characteristic signal is the letter "V" of the Morse Code every 10 seconds, thus:—

White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 0.5 sec.
Eclipse, 0.5 sec.
White light, 3.0 sec.
Eclipse, 4.0 sec.

Obstacle lights are fixed on all high obstacles

NIMES (Lat. 42 deg. 52 min. 0 sec. N., Long 4 deg. 25 min. 0. sec E.) is a Civil Aerodrome situated about three miles N.E. of the town of Nimes.

There is a landing "T" in the centre of the ground, and a wind sleeve in the north corner of the ground.

Four white "L's" indicate the area of ground in a good state for landing. There is a wireless station on the aerodrome, with a wireless mast in the north corner.

A petrol and oil store has been established on the aerodrome.

MILITARY STATIONS.—In addition to the above, the French Minister for War has granted permission to British civil pilots to land on the following French military aerodromes:—

Avord, Cazaux, Châteauroux, Dijon, Etamps, Istres, Luxeuil, Lyons, Malzeville, Pau, Romilly, Thionville, Tours, Hussein Day (Algeria).

Permission has also been given for civil pilots to land on the military manœuvre ground at Beauvais until further notice. The position of the ground is about 1½ miles south of Beauvais. This ground is used by troops, and in order to avoid accidents it is essential that pilots should not land direct, but should first fly round the ground at a height between 600 and 1,200 ft., or fire a signal from the machine, so that troops may have time to clear the ground.

2. AERIAL CUSTOMS STATIONS.

Article XI (Clause 1) of the "Provisional Agreement relating to Air Navigation between France and Great Britain" appoints Customs aerodromes as follows:—

"All aircraft entering France must land at, and any aircraft leaving France for England must depart from, one of the following aerodromes, viz.:—St. Inglevert or Le Bourget."

Seaplanes flying between England and France must alight at one of the following ports for the purposes of Customs examination:—

Dunkirk, Calais, Boulogne, Le Tréport, Dieppe, Havre, Caen, Cherbourg, St. Malo.

The French Customs Administration enforce the same regulations for a seaplane alighting at a port as for a ship entering

3. WIRELESS TELEGRAPHY AND RADIO TELEPHONY STATIONS.

The following wireless telegraphy and radio telephony stations, situated on the respective aerodromes, are established:—

Station.—LE BOURGET.

Nature of Transmission.—(1) (a) C.W. *Range.*—800 km. (b) Interterrupted C W. *Range.*—400 km. (c) Radio telephony. *Range.*—250 km. *Call Sign.*—Z.M. *Wave Length.*—900 m. *Hours of Transmission.*—07 00-19.00

Nature of Transmission.—(2) C.W. *Range.*—400 km. *Call Sign.*—Z.M *Wave Length.*—1,400 m. *Hours of Transmission.*—07.00-19.00. *Transmission at Fixed Times.*—07.30, 09.30, 10.30, 11.30, 13.30, 15.30, 18.30 (Meteorological messages relating to the London-Paris Service).

Station.—ST. INGLEVERT.

Nature of Transmission.—(1) C.W. *Range.*—400 km. *Call Sign.*—A.M. *Wave Length.*—1,400 m. *Hours of Transmission.*—07.00-19.00. *Transmission at Fixed Times.*—07.05, 09.05, 10.05, 11.05, 13.05, 15.05, 18.05 (Meteorological messages relating to the London-Paris Service)

Nature of Transmission.—(2) Radio Telephony. *Range.*—150 km. *Call Sign.*—A.M. *Wave Length.*—900 m.

Station.—LYONS (BRON).

Nature of Transmission.—C.W. *Range.*—400 km. *Call Sign.*—A.L. *Wave Length.*—1,400 m. *Hours of Transmission.*—07.00-19.00 *Transmission at Fixed Times.*—08.50, 10.50, 14.50, 16.20, 18.50 (Regional meteorological messages)

Station.—NIMES.

Nature of Transmission.—C.W. *Range.*—300 km. *Call Sign.*—A.N. *Wave Length.*—1,400 m. *Hours of Transmission.*—07.00-10.00. *Transmission at Fixed Times.*—07.10, 09.10, 13.10, 18.10 (Regional meteorological messages).

Station.—BORDEAUX (TEYNAC).

Nature of Transmission.—C.W. *Range.*—300 km *Call Sign.*—A.B. *Wave Length.*—1,400 m. (This station is not in operation at present.)

Station.—MAUBLUGE

Call Sign.—A.V. *Wave Length.*—1,200 m. (This station will later be incorporated in the Paris-London system with a wave-length of 1,400 m.)

4. DIRECTION FINDING WIRELESS STATIONS.

The following Direction Finding Wireless Stations have been established in France:—

Station.—Barre de L'Adour. *Wave Length in Metres.*—450. *Latitude.*—43 deg. 32 min. N. *Longitude.*—1 deg. 31 min. W *Call Sign.*—FLO.

Bernieres; 450; 49 deg. 20 min. N.; 0 deg. 25 min W.; UHN.
Brest-Capucins (2); 450; 48 deg. 19 min. N.; 4 deg. 35 min. W.; HUD.
Brest-Guipavas; 450; 48 deg. 27 min. N; 4 deg. 27 min. W.; FHA.
Casablanca-Chetaba (3); 450; 33 deg. 35 min. N.; 7 deg. 34 min. W.; FCH
Chemoulin; 450; 47 deg. 14 min N.; 2 deg. 18 min. W.; FUH.
Cherbourg; 450 & 600; 49 deg. 37 min. N.; 1 deg. 36 min. W.; FFC.
Le Havre; 450; 49 deg. 32 min N.; 0 deg. 07 min E.; FFU.
Lorient; 450 & 600; 47 deg. 44 min. N.; 3 deg. 21 min. W.; FFL.
Quessant-Pen ar Roch (1); 450 & 600; 48 deg 26 min. N.; 5 deg. 06 min. W.; FHY.

Pointe du Raz, 450; 48 deg. 02 min. N.; 4 deg. 44 min. W.; FPU.
Rochefort-Soubise; 450, 45 deg. 56 min. N.; 1 deg. 00 min. W.; HOB.
Treguier; 450; 48 deg. 50 min. N.; 3 deg. 14 min. W.; FQC.
Notes.—(1) Quessant-Pen ar Roch answers FFF, (2) Brest-Capucins answers FFK; (3) Casablanca-Chetaba answers CNP.

The regulations for French D.F. Stations are similar to those of the United Kingdom, the conditions of which will be issued shortly.

5 TELEPHONE PRIORITY.

The following telephone stations have priority for urgent communications with respect to the safety of Air Navigation :—

Stations in Connection.—Abbeville with Le Bourget *via* St. Inglevert; La Hève (meteorological) with military W/T Kleber Barracks; Pujaut (principal air station) with Nîmes (principal air station).

Telephone Exchanges.—Abbeville-Paris, Nord-Calais; Le Havre; Avignon-Nîmes.

6 METEOROLOGY.

The following Wireless Stations commenced on May 25th to issue warnings of squalls on a 1,400-metres wave length :—

Le Bourget, Z.M.; Strasbourg, C.3, Bourges, Y.E.; Amiens, Y.B.; Tours, Y.G.; Toulouse, Y.F.

N.B.—Stations issuing weather reports are given in the Wireless Section, while Notice to Airmen No. 88, of August 19th, 1920, gives further details of the reports issued.

7. CANCELLATION OF PREVIOUS NOTICES.

Notice to Airmen Nos. 15, 27, 28, 41, 43, 45, 50, 55, 59, 65, 66, 74, 75 and 76 of the year 1920 are hereby cancelled.

8 AUTHORITY.

Various French "Notices to Airmen" and official notices in the "Bulletin de la Navigation Aerienne."

[The maps referred to are not reproduced owing to lack of space.—Ed.]

AIR MINISTRY NOTICES TO AIRMEN, 1920.

In consequence of the increasing number of Air Ministry Notices to Airmen issued each week, and their greater average length, it is regretted that it is no longer possible to publish them in full. In future issues of this sheet a résumé will be given of all Notices to Airmen.

No. 103.—Sept. 30th.—Royal Navy Wireless Direction finding Stations (cancelled by No. 107).

No. 104.—Oct. 8th.—France: Customs Stations on the Swiss Frontier. Explains the area of operation of the Customs Aerodromes at Amberien, Dijon and Mulhouse, and Customs Seaplane Stations at Thonon, Evian and Annecy.

No. 105.—Oct. 8th.—Denmark: Customs Aerodrome and Seaplane Station at Copenhagen. Gives positions, maps and descriptions of Christianhavns Field and Naval Seaplane Station, both used for Customs purposes, at Copenhagen.

No. 106.—Oct. 1st.—Aerodromes for Civil Use: Consolidated List. Gives name, Lat. and Long., Ht. above sea level, nearest railway station, nearest town of five Government-owned aerodromes, of 50 aerodromes available for use in emergency only, and of 41 licensed civil aerodromes.

No. 107.—Oct. 11th.—Royal Naval Wireless Direction Finding Stations: Gives names, wave length, call sign, Lat. and Long. of Naval Wireless Stations at Amlwch, Berwick, Carnsore, Flamborough, Larne, Lizard, Peterhead, Rhyl and Seaview (Malin Head), all of which can be used by aircraft. The procedure to be adopted by aircraft requiring bearings is outlined.

No. 108.—Oct. 13th.—Flamborough Wireless Direction Finding Station: States that Flamborough is temporarily out of action.

The Air Mails.

Owing to the change over to winter time services the P.M.G. announces the following alterations in times for posting letters :—

LONDON—(a) UNREGISTERED LETTERS HANDED OVER THE COUNTER AT CERTAIN POST OFFICES.

General Post Office	11.30
Threadneedle Street branch office	11.15
Lombard Street branch office	11.15
Parliament Street branch office	11.00
Charing Cross branch office	11.20
West Central District office	11.40
Western District office	11.15
South-Western District office	11.15
South-Eastern District office	09.00

Registered letters must be handed in five minutes earlier in each case.

(b) LETTERS POSTED IN PUBLIC LETTER-BOXES.

Paddington and North-Western District offices	09.30
Eastern District office and Northern District office and larger branch offices in E.C. district	09.00
South-Eastern District office	08.30
Sub-districts	08.30 or overnight.

Overnight postings will, however, normally connect with the morning air mail to Paris.

Provinces.—At many places, especially in the South-East of England, an earlier time of posting for the afternoon air mail will be necessary. Information should be sought from the local postmaster.

The Postmaster-General takes the opportunity of stating that the present time of departure of the afternoon air mail to Paris from Croydon, viz., 3.30 p.m., has been found from experience not to be early enough regularly to ensure delivery of non-express letters in Paris the same evening, or connection with the night mail trains from Paris to destinations beyond. The new time of departure should normally enable both these advantages to be secured; and letters for Switzerland, Italy, Spain, and Portugal, posted in London the same day (or in the provinces after the mail despatches to London overnight) should, by use of the afternoon air mail to Paris, be accelerated in delivery by twenty-four hours.

There will be no alteration in the time of posting for the morning air mail to Paris.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system :— First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

OCTOBER 25th:

A.T.T., DH16, G-EALU, London-Paris, 10.21-13.48, G.&M., 4, Armstrong.
A.T.T., DH9, G-EAQA, London-Amsterdam, 10.23-14.30, G., Nil, Duke.
G.E.A., "Goliath," F-GEAB, London-Paris, 12.00-15.45, Nil, 1, Patin & 1.
A.T.T., DH18, G-EAUF, London-Paris, 13.30-16.35, G.&M., 5, Holmes.
M.A., Breguet, F-CMAG, London-Paris, 13.40-16.55, G., Nil, Le Sec.
A.T.T., DH9, G-EAPL, London-Amsterdam, 13.56—, Nil, Nil, Hinchcliffe.
B.A.C., Bristol, G-EAVU, London-Paris, 14.25-12.30/26, Nil, 1, Uwins.
A.T.T., DH18, G-EAUF, Paris-London, 10.03-12.00, Nil, 5, Holmes.
A.T.T., DH16, G-EAQS, Berck-London, —12.17, Nil, 3, Forson.
G.E.A., "Goliath," F-GEAD, Paris-London, 11.45-13.54, G., 3, Labouchere & 1.
C.T., Nieuport, F-ICGT, Paris-London, 12.25-14.50, M., Nil, Lasnes.
A.T.T., DH9, G-EAOL, Paris-London, 13.45-16.00, Nil, 2, Carter.
A.P.B., Westland, G-EAJL, Paris-London, 13.55-16.05, G., 2, McMullin.
A.T.T., DH9, G-EAQN, Amsterdam-London, 14.15-16.20, G.&M., Nil, Lines.
A.T.T., DH16, G-EASW, Berck-London, —16.50, Nil, Nil, Tebbit.

OCTOBER 26th:

A.T.T., DH16, G-EAPT, London-Paris, 09.55-12.30, G.&M., 2, Milnes.
A.T.T., DH9, G-EAQP, London-Amsterdam, 10.40—, G., Nil, Robins.
C.T., Nieuport, F-ICGT, London-Paris, 12.30-15.30, Nil, Nil, Lasnes.
A.T.T., DH16, G-EAQS, London-Paris, 13.05-15.27, G.&M., 3, Carter.
I.A.L., "Vimy," G-EASI, London-Paris, 13.45-16.40, G., 2, Chattaway & 1.
A.T.T., DH16, G-EALU, Paris-London, 10.00-12.00, G., 1, Bamber.
A.T.T., DH18, G-EAUF, Paris-London, 12.50-15.10, G, 7, Armstrong.
M.A., Breguet, F-CMAF, Paris-London, 13.45-16.04, G.&M., Nil, Le Men.
A.T.T., DH9, G-EAQA, Amsterdam-London, 14.10-16.30, G.&M., Nil, Duke.

OCTOBER 27th:

A.T.T., DH16, G-EALU, London-Paris, 11.39-14.05, G.&M., 2, Tebbit.
A.T.T., DH9, G-EAOL, London-Amsterdam, 11.35—, G., Nil, Lines.
A.P.B., Westland, G-EAMV, London-Paris, 12.00-14.50, Nil, 3, Powell.
G.E.A., "Goliath," F-GEAD, London-Paris, 12.10-15.00, G., 1, Labouchere & 1.
M.A., Breguet, F-CMAF, London-Paris, 12.34-15.40, Nil, Nil, Le Men.
A.T.T., DH18, G-EAUF, London-Paris, 13.25-15.55, M., 7, Forson.
I.A.L., "Vimy," G-EASI, Paris-London, 12.25-15.10, G., 4, Chattaway & 1.
A.T.T., DH16, G-EAQS, Paris-London, 13.40-15.36, G.&M., 2, Milnes.

OCTOBER 28th:

A.T.T., DH16, G-EASW, London-Paris, 10.00-12.50, G.&M., Nil, Bamber.
A.T.T., DH9, G-EAQN, London-Amsterdam, 10.15-14.10, G., Nil, Duke.
A.T.T., DH16, G-EAQS, London-Paris, 13.15-15.35, G.&M., 1, Armstrong.
A.P.B., Westland, G-EAJL, London-Paris, 13.15-16.00, G., 2, MacMullin.
I.A.L., "Vimy," G-EASI, London-Paris, 14.00-17.00, G., 4, Chattaway & 1.
A.T.T., DH16, G-EALU, Paris-London, 10.00-11.50, G., 1, Carter.
G.E.A., Farman 50, F-GEAV, Paris-London, 12.15-15.15, G., 1, Favreau & 1.
M.A., Breguet, F-CMAB, Paris-London, 13.00-16.15, G.&M., Nil, Challoux.
S.N.E.T.A., DH9, O-BIEN, Brussels-London, 12.10-14.55, M., Nil, Delzenne.
A.T.T., DH18, G-EAUF, Paris-London, 13.27-15.30, G., 2, Forson.
A.P.B., Westland, G-EAMV, Paris-London, 13.40-16.00, G., 1, Powell.
A.T.T., DH9, G-EAPL, Amsterdam-London, 14.20-16.32, G., Nil, Hinchcliffe.

OCTOBER 29th:

A.T.T., DH9, G-EAOZ, London Amsterdam, 10.05-14.00, G., Nil, Hinchcliffe.
A.T.T., DH16, G-EALU, London-Paris, 10.20-13.00, G.&M., 2, Milnes.
G.E.A., Farman 50, F-GEAV, London-Paris, 12.05-16.10, Nil, Nil, Favreau & 1.
A.T.T., DH9, G-EAQA, London-Paris, 13.20-16.05, G.&M., 1, Carter.
M.A., Breguet, F-CMAB, London-Paris, 13.49—, Nil, Nil, Challoux.
S.N.E.T.A., DH9, O-BIEN, London-Brussels, 14.45-09.50/30, Nil, 1, Delzenne.
I.A.L., "Vimy," G-EASI, Paris-London, 11.20-13.35, G., 5, Chattaway & 1.
G.E.A., "Goliath," F-GEAB, Paris-London, 11.45-14.00, G., 4, Patin & 1.
A.T.T., DH9, G-EAOL, Amsterdam-London, 10.50-13.08, G., Nil, Lines.

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Reprinted from "The Times," of Oct. 12th, 1920.

TO BUKAREST AND BACK.

BUSINESS MAN'S FLIGHT OF 3,250 MILES.

Mr. Reginald Wright, managing director of a Lancashire firm of locomotive engineers, arrived at Cricklewood Aerodrome yesterday on his return from a business visit to Rumania, having made the journey both ways by aeroplane, a distance in all of 3,250 miles. The last stage of the journey was a non-stop flight of 420 miles from Strasburg to London, accomplished in 3 hours 50 minutes, and the average flying speed for the whole journey was a non-stop wood was just over 100 miles per hour.

Having urgent business in Bukarest, Mr. Wright hired the aeroplane, a Handley Page with a Siddeley "Puma" engine of 230 h.p., and, piloted by Mr. H. H. Perry, formerly of the R.A.F., left London on September 12, by way of Brussels, Nuremberg, Vienna, and Belgrade. They reached Bukarest on September 16, but at Belgrade, where the pilot had to land on a military parade ground, they were detained two and a half days by the authorities on suspicion of being Bolshevist envoys, and were only allowed to proceed through the good offices of the British Charge d'Affaires. Mr. Wright used the machine also for travelling about Rumania. It enabled him, for instance, to visit Jassy, 215 miles away, and return to Bukarest in the day, whereas in the present state of the Rumanian railways the journey by rail would have taken 20 hours each way.

Mr. Wright and his pilot left Bukarest last Saturday, spent the night in Vienna, continued on Sunday to Strasburg, 415 miles, in one flight, and yesterday morning completed the journey of 1,635 miles in 16 hours 5 minutes actual flying time.

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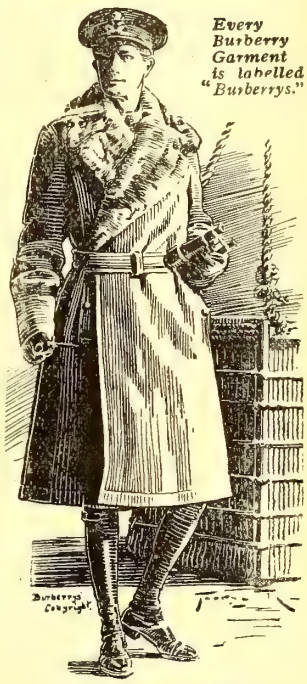

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A.T.T., DH9, G-EAQP, Rotterdam-London, —13.00, Nil, 1, Robins.
C.T., Nieuport, F-CGTI, Paris-London, 12.33-14.25, M., Nil, Le Comte.
A.P.B., Westland, G-EAJL, Paris-London, 13.10-15.04, G., 3, MacMullin.
A.T.T., DH16, G-EASW, Paris-London, 13 30-15 32, G., 1, Bamber.
A.T.T., DH9, G-EAQN, Amsterdam-London, 14.10-16.35, G.&M., Nil, Duke.

OCTOBER 30th:

A.T.T., DH16, G-EASW, London-Paris, 09.38-12.15, G.&M., Nil, Robins.
A.T.T., DH9, G-EAPL, London-Amsterdam, 09.52-13.15, G., Nil, Holmes.
C.T., Nieuport, F-CGTI, London-Paris, 10.45-15.50, Nil, Nil, Le Comte.
A.T.T., DH18, G-EAUF, London-Paris, 13.21-15.55, G.&M., 5, Forson.
A.T.T., DH16, G-EALU, Paris-London, 10.10-12.10, Nil, 4, Armstrong.
A.T.T., DH16, G-EASW, Paris-London, 13.30-15 40, Nil, 4, Carter.
M.A., Breguet, F-CMAG, Paris-London, 13.31-15.55, G.&M., Nil, Martel.
A.T.T., DH9, G-EAQA, Paris-London, 13.35-15.55, G., Nil, Milnes.
S.N.E.T.A., DH9, O-BIEN, Brussels-London, 12.20-15.05, M., 1, Wunters.
A.T.T., DH9, G-EAOZ, Amsterdam-London, 14.45-17.15, M., Nil, Hinchcliffe.
G.E.A., "Goliath," F-GEAB, London-Paris, 11.40-16.00, Nil, Nil, Patin & 1.

OCTOBER 31st:

A.P.B., Westland, G-EAMV, London-Paris, 13.27-17.00, G., 1, Orde.
A.T.T., DH18, G-EAUF, Paris-London, 10.32-12.30, G., 4, Forson.
A.T.T., DH9, G-EAPL, Amsterdam-London, —14.25, G., Nil, Holmes.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

OCTOBER 25th:

H.P.T., DH4a, G-EAVL, London-Amsterdam, 14.03—, G.&M., 2, Foot.
H.P.T., HP, G-EASN, Brussels-London, 12.05-14.20, G.&M., 4, Rogers & 1
H.P.T., HP, G-EATL, Paris-London, 13.00-15.47, G., 3, Bager & 1.
H.P.T., DH9, G-EAUP, Berlin-London, 09.15—17.07, Nil, 1, Fowler.

OCTOBER 26th:

H.P.T., HP, G-EATU, London-Paris, 12.30-17.20, G., 3 plus 1 dog, Beal & 1.
S.N.E.T.A., DH4, O BADO, London-Brussels, 13.50-16.40, Nil, Nil, George
H.P.T., HP, G-EASN, London-Amsterdam, 13.50—, G.M., Nil, Olley & 1
H.P.T., DH9, G-EAUC, London-Brussels, 14.00-11.00 (27th) G.&M., Nil, Halliwell.
S.N.E.T.A., DH4, O-BABI, Brussels-London, 12.10-14.12, G.M., Nil, Briere
H.P.T., HP, G-EASL, Paris-London, 12.50-15.55, G., 3, Capps & 1.
H.P.T., DH4a, G-EAVL, Amsterdam-London, —16.47, Nil, Nil, Foot

OCTOBER 27th:

H.P.T., HP, G-EATL, London-Paris, 12.10-15.50, G., 7, Bager & 1.
H.P.T., DH9, G-EAUP, London-Amsterdam, 13.55—, M., Nil, Fowler.
H.P.T., DH9, G-EAUC, Brussels-London, 12.45-14 50, G.&M., 1, Halliwell
H.P.T., HP, G-EASY, Paris London, 13.00-16.15, G., 5, Jones & 1.

OCTOBER 28th:

H.P.T., HP, G-EATN, London-Paris, 12.10-16.03, Nil, 7, Halliwell & 1.
H.P.T., HP, G-EASL, London Paris, 12.18-16.03, G, 3, Jones & 1.
H.P.T., DH4a, G-EAVL, London-Amsterdam, 13.53—, G.&M., Nil, Foot
H.P.T., DH9, G-EAUC, London-Brussels, 14 05-17.00, G.&M., Nil, Hope.
H.P.T., HP, G-EASN, Amsterdam-London, 12.20-16 18, G M, 1, Olley & 1
H.P.T., HP, G-EATH, Paris-London, 12.40-16.47, Nil, 3, Beal & 1.

OCTOBER 29th:

H.P., SE5, G-EATE, London-Paris, 08.15, landed Abbeville, Nil, Nil, Perry.
H.P.T., DH9, G-EATA, London-Hamburg, 09.17-13.13 (Amsterdam), Nil, 2, Olley.
H.P.T., DH9, G-EAUP, Amsterdam-London, 08.45-11.20, GM, Nil, Fowler
H.P.T., HP, G-EASY, London-Paris, 12.17-16.20, G., 8, Beal & 1.
H.P., Bristol, G-EASH, London-Brussels, 13.57-17.15, G.&M., 1, Fowler.
H.P.T., DH9, G-EAUP, London-Amsterdam, 13.33—, G.&M., Nil, Capps.
H.P.T., DH9, G-EAUC, Brussels-London, 12.25-14.23, Nil, 1, Hope.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 12.25-14.43, G.&M., 2, Van Opstal.
H.P.T., DH4a, G-EAVL, Amsterdam-London, 12.52-15.00, Nil, Nil, Foot.
H.P.T., HP, G-EASL, Paris-London, 12.52-15.35, Nil, 2, Bager & 1.

OCTOBER 30th:

H.P.T., DH4a, G-EAVL, London-Pau, 09.15, arr. Paris 12.00, left again 13.00, Nil, 1, Foot.
H.P.T., HP, G-EATH, London-Paris, 12.06-16.00, G., 8, Bager & 1.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 13.45-16.30, G.&M., 2, Van Opstal.
H.P.T., HP, G-EASL, London-Amsterdam, 13.30—, G.&M., 3, Rogers & 1
H.P.T., HP, G-EATL, Paris-London, 14.00-16 45, G., 6, Jones & 1.

OCTOBER 31st:

S.N.E.T.A., DH9, O-BIEN, London-Brussels, 12.25-16.25, Nil, Nil, Wouters
H.P.T., HP, G-EATJ, Paris-London, 12.30-14.45, Nil, 3, Beal & 1.
H.P.T., DH9, G-EAUP, Amsterdam-London,—15.30, Nil, Nil, Capps.
H.P., Bristol, G-EASH, Brussels-London, 12.20-15.55, Nil, 1, Fowler.

Air Port Statistics.

MACHINES:—

	Croydon	72	Cricklewood	39	Total 111

PERSONNEL—Passengers:

	Croydon	109	Cricklewood	83	Total 192
Crews:					
	Croydon	83	Cricklewood	57	Total 140

Total Passengers and Crews 332

Inland Flying at Croydon.

Oct. 25th.—Bristol from Bristol; A.T.T, DH9, 1 joy-ride.
Oct. 26th.—A.T.T., DH9, 1 joy-ride; Leatherhead Aviation Co., 1 Avro from Leatherhead, return.
Oct. 27th.—A.T.T., DH18, 2 tests; H.P., DH4 from Cricklewood.
Oct. 28th.—I.A.L., Bat, 2 tests.
Oct. 29th.—A.T.T., Avro, 1 test, 1 joy-ride, 2 joy-rides.
Oct. 30th.—A.T.T., DH9, 5 joy-rides; I.A.L., Bat, 1 test; A. V. Roe and Co., Avro triplane to Hamble; S.N.E.T.A., DH9 to Cricklewood.
Oct. 31st.—I.A.L., Bat to Bristol.

Inland Flying at Cricklewood.

Oct. 25th.—H.P.T., DH9 to Croydon return; BE2e and AW from Waddon, William Beardmore and Co., WB8 to Glasgow.
Oct. 26th.—H.P.T., BE2e 2 tests; Sopwith "Pup" from Castle Bromwich.
Oct. 27th.—S.N.E.T.A., DH4 to Croydon; H.P.T. BE2e 2 tests; DH9 from Lympne.
Oct. 28th.—H.P.T. O/400 test; DH9 test.
Oct. 29th.—Nil.
Oct. 30th.—S.N.E.T.A., DH9 from Croydon.
Oct. 31st.—H.P.T., O/400 started for Paris but returned.

The London Terminal Aerodrome

It seems to one that it would pay a firm to run joy-rides during the week-ends at about five shillings a head; just up, one circuit, and down again. People used to pay two guineas for this before the war, and many of the crowd who appear on Sundays would pay five shillings for a short flight who cannot afford a guinea for the longer trip. Besides, it would be good propaganda and ensure plenty of flying.

Even if there is not much doing in the flying line on Sundays, Croydon is always worth visiting for those who spend their week in town. Besides being right out in the country so far as the air and the view are concerned, an excellent tea can be obtained in the comfortable lounge of the Trust House, which, since inauguration, has been in the capable hands of Mrs. Middleton. For the casual visitor, as well as the permanent settler, the arrangements are excellent in normal times, and one does not doubt that they will be all right at the next "show," whenever that is.

The "Puma" engined Fokker is expected shortly. One understands that it would have been here before but for radiator trouble.

The Air Post of Banks are running their daily service each way with mechanical regularity. Their artistic though mechanically inaccurate poster has attracted great attention. It depicts very accurately "The Air Post of Banks (in formation)," as the legend on the side of the machines states.

On Wednesday an Avro belonging to the Aircraft Disposal Company, taking off across wind, had engine failure at a height of about 40 ft. and landed without the aerodrome.

Mr. Bert Hinkler went off to Southampton on the Avro triplane which participated in the Martlesham trials. He hopes to be up again later in the week with a two-seater "Baby" Avro.—G. D.

A.T. and T. Notes.

The only difference which the fog has made to the A.T. and T. services is that the times of starting of the 09.30 machine has been slightly delayed. Those who have had the misfortune of using the train services have not been so fortunate, as these have been *very* late and *very* attenuated.

The original Napier-engined "16" G-EARU, which has been overhauled, will shortly be on the service again. Everything else has been going as usual, that is to say excellently.

On Wednesday Mr. Armstrong was testing the D.H.18. He made several wide circuits at a considerable height. His final landing was as good as any one has seen for a big machine of this type. The "18" has yet to be equalled for comfort, speed, and view from the cabin, to say nothing of strength of construction and safety, the big windows and door and the two large emergency exits in the roof inspire more confidence in the inmates than in any other machine in which one has flown, or even seen.

On Saturday a D.H.9 was joy-riding all the afternoon, and some days previously the members of a notorious jazz-band, having jazzed in front of a machine to be photographed "before flying to Paris," were taken for short joy-rides in a "9" by Mr. Duke, now an A.T. & T. pilot, who at one time was with the British Aerial Transport Co., the moving spirit of which is Sir Samuel Waring, Bart., who obtained his baronetcy for his services to aviation.—G. D.

The Instone Air Line.

The "Vimy" has been on the Paris service during the week. She is about to start on a series of flights to a distant part of Europe, of which more anon.

The "Bat" (which was built by the B.A.T. Co., of which the moving spirit is Sir Samuel Waring, Bart., who obtained his baronetcy for his services to aviation) has been fitted up as a darkroom in order to assist in a press "stunt" with the most enterprising of evening journals. Mr. Barnard took her to Bristol on Sunday for this purpose. She was to proceed to her destination on Monday.—G. D.

A Presentation.

On Oct. 28th H.R.H. the Prince of Wales, K.G., received at York House a boy named J. R. Baker and accepted from him a model aeroplane with which Baker won first prize in the junior section of Messrs. Thomas Parsons and Sons' model-making competition. His Royal Highness admired the model very greatly.

An Official Discovery.

The Department of Civil Aviation is to be congratulated on having discovered what might otherwise have been a dark horse among British high speed aeroplanes. In the *communiqué* issued on Oct. 20th, 1920, No. 266, time 17.30, it appears that Handley Page G-EASY, belonging to Handley Page Transport, Ltd., left Paris at 12.45 with six passengers and goods on board, and arrived at Cricklewood at 13.03.

This allows 18 minutes for the complete journey of, roughly, 240 miles, which works out at approximately 13 miles per minute, or 780 miles per hour. It seems that it would be worth while to back it as a long shot for the race next year for the Cox Trophy, which, one gathers, is to replace the extinct Gordon Bennett race.

Possibly Handley Page Transport, Ltd., might do well out of letting seats in the machine as a prospective winner of next year's Aerial Derby. Can it be that all unknown the new Handley Page Wing has been put in operation on one of the O/400 type, or is it some species of aeronautical thyroid gland which has been discovered by the H.P. laboratory?

Stoke-on-Trent.

The return visit of the Berkshire Aviation Co.'s circus to Stoke-on-Trent for the period Oct. 26th to Nov. 9th has been very successful, and large crowds have gathered daily at Port Hill Meadow to see the display of stunt flying, and during the first week-end between 80 and 100 people availed themselves of the opportunity of going up for the modest charge of 12s. 6d. Free flights were arranged in conjunction with the *North Staffs Sentinel*, and considerable enthusiasm was shown in the ballot for the lucky number.

A praiseworthy feature of the visit of the Berkshire Aviation Co. is the fact that a portion of the takings is turned over to the local infirmary, so that all visitors to the Port Hill Meadow Aerodrome have the satisfaction of knowing that they are assisting at least one well-deserving cause, even if they do not interest themselves in the future of aviation.—O. F. J.

Woking.

Owing to the strike of the miners the works of Messrs. Martinsyde, Ltd., were closed down for stock-taking at midday on Oct. 22nd, until Nov. 8th, unless the strike should be prolonged for a longer period. Previous to closing the works the firm had discharged over a hundred employees, whom, however, they will re-engage when the works are re-opened. For some weeks past the men in the shops have been working half-time, with no work on Saturdays. About 1,000 workpeople have been temporarily thrown out of employment by the closing of the factory.—J. F. S.

FOREIGN INTELLIGENCE.

ARGENTINA.

The Argentine correspondent of THE AEROPLANE writes :—

Aerial Legislation.

Although aviation is not so far advanced here as in Europe or the United States, and the air not, at present, thick with machines to such an extent as to obscure the sky, legislation is already in hand designed to regulate flying in all its aspects and branches, outside, of course, the national military and naval services. The committee appointed by the Ministry of War has been dealing exhaustively with this subject. Flying within the limits of the Republic is to be controlled. Several of the projected provisions will be very sympathetically regarded by nervous householders, who fear that the acrobatic lunatic giving stunts over the premises will fall on the roof or smash up the flower pots. This sort of thing will, except in specified cases and places, be "caused to cease." There is to be no flying of a spectacular or risky nature over populated areas, and aviators must be fully qualified and in possession of certificates to that effect, and their machines must likewise carry certificates of airworthiness.

Military or naval aircraft are to have access to any aerodrome. Any service of machines may be conceded, if of public utility, on reasonable conditions. In national emergency all aircraft may be commandeered without exception.

Log books must always be carried, as well as a list of standing instructions and signals.

Customs Houses, lights, prohibited areas, diplomas, etc., are all considered, and penalties in particular have not been forgotten. Among the latter are imprisonment for not more than six months or a fine of not more than £200, or, if necessary, both together.

The consideration of these aerial regulations has given confidence to existing and proposed aviation companies, who will soon have the satisfaction of knowing their legal and national standing.

A Projected Atlantic Flight.

The Minister of War, Dr. Moreno, has informed Capt. Zuloaga of the impossibility of the Government helping his projected flight from Puerto de Palos (Spain) to Buenos Aires, on account of the lack of the necessary materials for carrying it out.

On account of this reply Capt. Zuloago went to the Ansaldo Co. and asked them for the loan of a machine, having already obtained leave for the necessary time to carry out his project. He is convinced that, once having obtained the machine, a public subscription will be raised with the help of the well-known actor, Parravicini.

German Aeroplanes for Commercial Services.

Various aeroplanes have been embarked from Germany to Buenos Aires. Some of these are intended for the Rio de Janeiro to Buenos Aires route.

Flying at Cordoba.

Capt. Holland has again resumed flying. He recently flew from Buenos Aires to the city of Cordoba with a well-known and wealthy rancher. He stayed in the city three days, giving many passenger flights and taking oblique photographs of Cordoba before returning to the South.

Gen. Livingston's Farewell.

On Sept. 21st the President of the Republic gave an audience to Brig.-Gen. Guy Livingston. Mr. J. A. Hinds accompanied him.

Gen. Livingston made his adieux to Dr. Irigoyen, previous to returning to London, after being engaged in making arrangements for the establishment of aerial services in the Republic.

The President assured Gen. Livingston of the benevolent eye with which the Government regarded such enterprises.

Aerodrome for Rosario.

The Rosario Aero Club are formulating an ambitious scheme for an aerodrome equipped with hangars, workshops, and club-rooms, close to the city.—"DUMSPIRAL."

BELGIUM.

A correspondent of THE AEROPLANE in Belgium writes :—

Closing of Antwerp Aerodrome.

Although some 1,200 passenger flights took place during the summer, and more than 100 passengers embarked at Antwerp for London or Paris the Antwerp Aerodrome has been closed and the aeroplanes and all material have been shipped back to Evère. The 4th Military Flight Squadron is now in possession of the site.

With this blow to all energetic aviation enthusiasts in Belgium, more particularly to M. Jean Olieslagers, the devoted defender of Antwerp's air port, the projected Antwerp-Strasbourg line and the improvements in the British and French Air Mail, are now things of the past. Its memory merely remains to show that the spirit of procrastination and the colossal lack of initiative and foresight prevails not less in Belgium than it does in other countries.—E. V. Q.

Belgian Aeronautics.

The following letter has been received from a correspondent in Belgium :—

The article in THE AEROPLANE of Sept. 29th on "Air Transport in Belgium" interested me somewhat. If the Brussels-London and Brussels-Paris services are not well advertised in Antwerp, this cannot be said to be the case in Brussels, where there are countless notices up stating "Daily Service to London and Paris," and "Flying every day at Evere." I should have thought that this first notice would have conveyed to the average intelligence that letters might be sent by that means, even if there were not notices in the Post Office giving full details of the air mail, as there are.

The S.N.E.T.A. organised a small meeting yesterday at Evere, in conjunction with the "fat-porters" race from Buc. It was without exception the worst run show I've ever seen. No effort was made to tell the spectators what was going on (as entry was free perhaps they thought that that was too much to expect). There was no form of enclosure for the public, who streamed about much as they liked, and only a merciful providence prevented a bad accident of some sort. Meanwhile competitors were getting off and landing, and occasionally a joy-ride 'bus would get off and subsequently land, only adding to the confusion of the unfortunate individual who was trying to understand what was going on. Two Hanriot Scouts and a Fokker DVII went up and stunted when things were getting dull. The Belgians may like it, but I don't like to see a man stalling his machine or coming down in a spin to within 500 ft. of the heads of a crowd, as they did.

The latest S.N.E.T.A. returns show that from Nov. 14th, 1919, to Oct. 1st, 1920, they carried out 1,327 passenger flights with 3,609 passengers at Evere, and from July 1st, 1920, to Oct. 1st, 1920, they carried 1,135 passengers at Wilrych (Antwerp). It appears that the G.O.C. Antwerp has claimed the latter ground for military purposes, so presumably the S.N.E.T.A. will have to find another. They have a curious

collection of machines at Evere : Ex-Hun L.V.G.s and Rumpler two-seaters, converted to carry four passengers as well as the pilot. Two passengers sit in the observer's cockpit and two in a space (you can't call it a seat) behind that. They manage to stagger round over Brussels all right.

Then they've got Fokker single-seater scouts, converted to carry a passenger, several Breguets and D.H.s. I asked one of the S.N.E.T.A. mechanics what type of motor the latter had, and he replied "'Andley Page." This was too much for me and I asked further questions.

Last, but not least, they have a Farman "Goliath," which takes families for joy-rides, and scrapes the chimney tops of Brussels.

Aerial Mail Figures.

The following figures show the number of parcels and letters carried between Brussels-London, London-Brussels and Brussels-Paris during the months of July-October respectively, by the various Air Lines operating on those routes.

	Brussels-London.	London-Brussels.	Brussels-Paris
July	754	1581	1054
August	1953	2325	1023
September	2580	4560	1380
October	2387	6075	2449

It may be noted that the figures for October are not quite complete owing to the fact that these figures were compiled a few days before the end of the month; nevertheless, the figures for the London-Brussels service show a considerable increase, and serve to show that business people in this country are beginning to realise the value of aerial transportation.

DENMARK.

The Danish correspondent of THE AEROPLANE writes :

An Air Service Conference.

A large international conference for planning the air services of 1921 is being prepared for at Copenhagen during October, when representatives of Norwegian, Swedish, German, Dutch, English and Danish air navigation companies are to meet.

Dit Danske Luftfartselskab is negotiating with the German postal authorities to discontinue the air mail services during the winter months.—HI.

The Parachute Experts.

Being on a Continental circuit, Miss Sylvia Boyden and her uncle, Major Ord Lees, have now been at Copenhagen, where Miss Boyden jumped with her "Guardian Angel" parachute from a Rumpler biplane at the Lundtofte aerodrome on a stormy Sunday.

Flying in Iceland.

Mr. Frank Fredricksen, late R.A.F., has been doing a good deal of flying lately in Iceland for the Flugfelag Islands (The Icelandic Aviation Co., of Reykjavik). Mr. Fredricksen's machine is an Avro, like that of so many other people who are pioneering aviation in out-of-the-way parts of the world. For use under adverse circumstances on small or only partly prepared aerodromes, and for demonstrating to a people unaccustomed to flying the safety and reliability of aviation, there is certainly nothing better than the Avro.

One gathers that the result of Mr. Fredricksen's flying in Iceland this summer has not been particularly successful from a financial standpoint, but he has been able to demonstrate that flying is not as dangerous as some people would like others to believe. There are, however, a good many people in Iceland who in general believe in the actual advantages of flying in that country where railways or roads are non-existent or of the most primitive kind. It certainly seems unlikely that in a country with so small a population as Iceland and such a vast tract of mountainous and barren land, there can possibly be much opening for fast and regular aeroplane services all over the country. Also the weather for a great part of the year is very much against flying.

On the other hand there certainly are great possibilities for seaplanes and flying boats, in view of the fact that Iceland exists very largely on her fishing trade, and the big business firms who handle the fishing industry would certainly benefit by rapid communication along the coast between one fishing town and another.

As regards the weather, and the perpetual darkness during the middle months of the winter, it is just as well to remember that the aeroplane, like the motorcar, scores over animal transport, in that while an animal is standing idle owing to darkness or bad weather, it is shortening its life. But an aeroplane under similar circumstances is lengthening its life by precisely the period during which it is standing idle. That is to say, an animal is living and nearing its death all the time it is on the ground, whereas an aeroplane is only living and nearing its death through the wearing out of its materials while it is actually off the ground.

This point is particularly worthy of attention by those who are considering the use of aerial transport in countries where bad weather is frequent.

Recently Mr. Fredricksen had something of an adventure in making a journey from Reykjavik to the Westman Islands. These islands lie some ten miles off the mainland about seventy miles east of Reykjavik. Most of them are merely huge boulders of lava, and the only inhabited island has an area of 12 square miles, and supports some 1,500 hardy fishermen and their families.

Owing to this island being practically surrounded by pinnacles of rock, the air in the vicinity is considerably disturbed, and Mr. Fredricksen, with his mechanic, Serjt. W. Turton, late R.A.F., had an extremely bad passage, both going to the island and getting away from it. In going to the island Mr. Fredricksen had to make three attempts to land before he could do so.

On his way from the island to Eyrabakka, where he had his supplies of petrol and oil, he ran out of petrol at about half way and had to land on the sand near the sea owing to the rockiness of the country inland. It took 21 hours to obtain petrol and oil from his store owing to lack of telephones and roads.

It would hardly appear that there is much of an opportunity for commercial aviation with land machines in Iceland, but, as has already been said, seaplanes could be used with advantage, and subsequently there will undoubtedly be a mail line between Iceland and Denmark as well as another probably between Iceland and the British Isles.

FRANCE.

A New World's Speed Record.

On Oct. 21st M. Sadi-Lecointe, flying the Nieuport biplane (300 h.p. Hispano-Suiza) used by M. Kirsch in the Gordon Bennett Cup Race, succeeded in putting up the world's speed record to 302.525 km. or about 189 m.p.h. At 16.00 o'clock, flying very low, sometimes not more than 10 ft., over the kilometre course at Villacoublay, he covered the outward journey in 12 1-10 sec. and the return journey in 11 7-10 sec., giving an average time of 11 9-10 secs.

A correspondent in France writes :—

The Buc Meeting.

De Romanet had a very narrow escape on the 9th instant, when trying to beat his speed record of 292.68 km. per hour made previously on the same day. His engine was "revving" at 2,500 when the "fairing pot" in the airscrew broke, bursting his airscrew, the débris damaging his bottom plane, undercarriage and radiator. Any pilot without his ability would certainly have been killed, as he was doing well over 180 m.p.h. at the time.

Sadi Lecointe was able to get another speed test on the 10th, and increased de Romanet's record by 4.12 km., thus leaving him the "record man" of the meeting.

Practically every type of machine was represented at the meeting, from the 1913 Blériot monoplane to the latest Spad six-seater Salmson-engined machine, and the Nieuport passenger machine that was exhibited at the last Paris Aero Show.

Casale flew the Bleriot "Mammoth" (four 300 h.p. Hispano-Suiza engines) with a dead load of 1 ton. This machine now appears to fly very well.

Altogether the meeting was a great success, drawing huge crowds, and it is said that it will be repeated at Le Bourget next spring.—E. N.

CIVIL AVIATION IN ICELAND.

The Avro biplane owned by the Icelandic Aviation Co. of Reykjavik, which has been flown recently in Iceland by Mr. Frank Fredricksen, late of the Royal Air Force. It is stated that the topography of Iceland is more suitable for the use of seaplanes than for land machines.

AIRCRAFT IN PARLIAMENT

ROYAL AIR FORCE (RUSSIAN SERVICE).

Mr. CHURCHILL, in reply to Mr. R. McNeill, said that airmen who served at Archangel after Nov. 11th, 1918, are entitled to the British War Medal and Victory Medal.

* * *

Oct. 27th.—The following written answer was given :—

PEACE TREATIES.—BRITISH SECTION, AERONAUTICAL COMMISSION OF CONTROL, BULGARIA.

Mr. CHURCHILL, in reply to Major D Davies, said that the British Section of the Inter-Allied Aeronautical Commission of Control for Bulgaria left England on Aug. 14th last to supervise compliance with the air clauses of the Peace Treaty with Bulgaria. The British Section consists of three officers and six other ranks. The cost of the Commission will be borne by Bulgaria. The number of aeroplanes and seaplanes to be destroyed is 57. No other British personnel was available in the neighbourhood for this duty.

THE ROYAL AERONAUTICAL SOCIETY.

ELECTION OF MEMBERS.

The following Members were elected in the various grades as shown at a Council Meeting held on October 19th :—

Fellows.—Lt.-Col. W. A. Bristow, the Rt. Hon. Lord Weir of Eastwood.

Associate Fellows.—Flt. Lt. J. C. Atkinson, J. W. Copley, W. E. Dumbrill, B.Sc., J. E. Jones, B.Sc., H. Rogerson, Capt. C. G. Sturt, A.F.C., Capt. L. J. Wackett

Students.—H. R. Cox, S. H. Evans, P. T. Griffith, J. P. Rathbone, G. M. Scott, F. C. Whitmore, Chaucer Wood.

Members.—W. J. Adderley, Flt. Lt. C. Russell Cox, Lt. C. G. Little, U.S.N.

Associate Members.—E. P. Appleby, Flt. Lt. C. Hilton Keith, A. Ruthven-Stuart, Lt.-Col. H. Laws Webb, F. J. McConnel.

Foreign Member.—Lieut. H. Sorensen, Danish Navy.

SCOTTISH BRANCH.

Fellow.—Prof. A. H. Gibson, M Inst.C.E., F.R S E.

Associate Fellows.—A. E. Marsden, H. E. Yarrow, C.B.E., M.Inst.C.E.

Associate Members.—A. M. Kay, R. G. Millar, A. Page, T. H. Storer.

Student.—A. Cairns.

AIR MAIL.

It has been decided that in future letters will be sent by Air Mail in the case of all correspondence to countries which are so served. It is felt that if all Members of the Society would follow the same course practical assistance would be given to the development of commercial aviation.

LIBRARY.

The following book has been received and placed in the Library :—"Commercial Airships," by H. B. Pratt, M.I N.A.

October 23rd, 1920. W. LOCKWOOD MARSH, Secretary.

LECTURES.

The next meeting will take place at the Royal Society of Arts, at 5.30 p.m on Thursday, Nov. 4th, when Wing Commander M. Flack will read a paper on "The Human Machine in Relation to Flying." Sir Humphrey Rolleston, K.C.B., M.D., F.R.C.P., will be in the chair.

Air Vice-Marshal Sir E. L Ellington, K.C.B., C.M.G., C.B.E., Director-General of Supply and Research, will take the chair on the occasion of M. Louis Damblanc's paper on "The Problem of the Helicopter," which is to commence at 5 p.m. on Thursday, Nov. 18th, at the Royal Society of Arts.

Air Marshal Sir H. M Trenchard Bart., K.C.B., D.S.O., is to take the chair at the lectures on Dec 2nd, at 5.30 p.m., at the Royal Society of Arts, when Major G H. Scott, C.B.E., D.F.C., will read a paper on "Airship Piloting," and Flight Lieut. F. L. C. Butcher will read one on "Airship Mooring."

ANNUAL DINNER.

Notices of the annual dinner, which is to take place at 7.0 for 7.30 on Wednesday evening, Nov. 17th, at the Connaught Rooms, should now be in the hands of all members. Early application for tickets (price one guinea per head, exclusive of wines) is advisable as many applications have already been received and the room which has been taken can only accommodate 200 diners. The President of the Society, Lord Weir of Eastwood, is to be in the chair. Members are invited to bring guests, and ladies will be welcome.

EXAMINATIONS.

The Report of the Examinations Committee was presented to the Council on Oct. 19th and was adopted. It contained provisions as to the general qualifications from outside bodies which should be accepted in lieu of the Society's examinations for Associate Fellowship. A second committee, under the chairmanship of Dr. Leonard Bairstow, Fellow, has now been appointed to prepare a detailed list of the specific degrees, etc., which shall be accepted, and to draft rules for governing the Society's examinations.

LIBRARY.

The following book has been received and placed in the Library : "The Motor Marine and Aircraft Red Book, 1920."

JOURNAL.

The November issue of the "Aeronautical Journal," which will be published on Nov. 1st, contains a paper on "Civil Aviation," by Major-General Sir F. H. Sykes, G.B.E., and "A Few Remarks Concerning Some Fundamentals of the Theory of Blade-Screws," by Dr. George De Bothezat.

W. LOCKWOOD MARSH,
Oct. 30th, 1920. Secretary.

THE ROYAL AERO CLUB.

FINANCE COMMITTEE.

A meeting of the Finance Committee was held on Tuesday last, Oct. 26th, 1920, when there were present : Mr. J. H. Nicholson, in the chair; Mr. Ernest C. Bucknall; Lieut.-Col. F K McClean; Lieut.-Col. Alec Ogilvie; and the Secretary.

JOINT STANDING COMMITTEE OF THE ROYAL AERO CLUB AND THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS.

A meeting of the Joint Standing Committee of the Royal Aero Club and the Society of British Aircraft Constructors was held on Wednesday last, Oct. 27th, 1920, when there were present :

Royal Aero Club—Lieut.-Col. J. T. C Moore-Brabazon, M.C., M.P., in the chair; Squadron Leader T. O'B. Hubbard, M C., R.A.F.; Lieut.-Col. F. K. McClean; Lieut.-Col. Alec Ogilvie, Group Capt. C. R. Samson, C.M.G., D.S.O., R.A.F. (representing Racing Committee of the Royal Aero Club).

Society of British Aircraft Constructors—Capt. P. D. Acland; Mr James Bird; Mr. Hamilton Fulton; Mr. Charles V. Allen (secretary).

Harold E. Perrin, secretary, Royal Aero Club.

Programme of Racing for 1921.—A general discussion took place on the Club's programme of races for next year drawn up by the Racing Committee. It was decided to meet again within a month, by which time the Committee of the Society of British Aircraft Constructors would have had an opportunity of considering the proposals put forward by the Club.

It was reported that a speed race, to take the place of the Gordon-Bennett Race, would no doubt be instituted next year, and the conditions to be recommended to the Federation Aeronautique Internationale were discussed.

The conditions for next year's Jacques Schneider Race were also discussed and deferred till next meeting.

The proposal of the Club's Racing Committee to hold the Aerial Derby in June, 1921, was reported.

The classification of machines was discussed and deferred pending a report from the Technical Committee of the Society of British Aircraft Constructors.

COMMITTEE MEETING.

A meeting of the Committee was held on Wednesday last, Oct. 27th, 1920, when there were present : Lieut.-Col. J. T. C Moore-Brabazon, M.C., M.P., in the chair; Mr. Ernest C. Bucknall; Squadron Leader T O'B. Hubbard, M.C., R.A.F.; Lieut.-Col F. K. McClean; Lieut.-Col. Alec Ogilvie; Lieut.-Col. Mervyn O'Gorman, C.B.; and the Secretary.

Election of Members.—The following new members were elected :—Major Sidney Tremlett Baker (late R.A.F.); Flying Officer Ernest Patrick Dampier, R.A.F ; Harry John Morris; Flying Officer George Arthur Pennington, R.A.F.; Major Lawrence Henry Girdwood Stanbrough (late R.E.).

Joint Standing Committee of the Royal Aero Club and the Society of British Aircraft Constructors.—Report of meeting of the Joint Standing Committee of the Royal Aero Club and the Society of British Aircraft Constructors held on Oct. 27th, 1920, was received and adopted.

Flying Services Fund.—Report of meeting of Flying Services Fund Committee held on Oct. 11th, 1920, was received and adopted.

Jacques Schneider Cup, 1920.—Letter was read from the Federation Aeronautique Internationale, dated Oct. 19th, 1920, intimating that the race for the Jacques Schneider Cup, held at Venice on Sept. 19th-21st, 1920, had been won by the Italian representative, Mr. Luigi Bologna, on a 470-h.p. Savoia machine, the course of 200 nautical miles being completed in 2 hr. 10 min. 35 sec. at an average speed of 172.561 km. per hour.

The Secretary reported that arrangements had been made for the dispatch of the trophy to the Aero Club of Italy This action was confirmed.

Finance Committee.—Report of meeting of Finance Committee held on Oct. 26th, 1920, was received and adopted.

Aviators' Certificates.—The following aviators' certificates were granted : 7901, Mrs. Dulcibella Atkey; 7902, Anthony Bellingham-Smith; 7903, Edward Richard Swancott Gray.

"DAILY EXPRESS" £10,000 PRIZE : FLIGHT TO INDIA AND BACK.

The Government having stopped all attempts to win this prize, owing to the conditions on the routes in the Near East, and the competition having closed on Oct. 31st, 1920, the Club approached the proprietors of the *Daily Express* with a view to the competition being reopened next year.

In a letter to the Club, dated Oct. 20th, 1920, Mr. R D. Blumenfeld replied that, having gone fully into the question, the proprietors of the *Daily Express* had reluctantly come to the conclusion not to do so.

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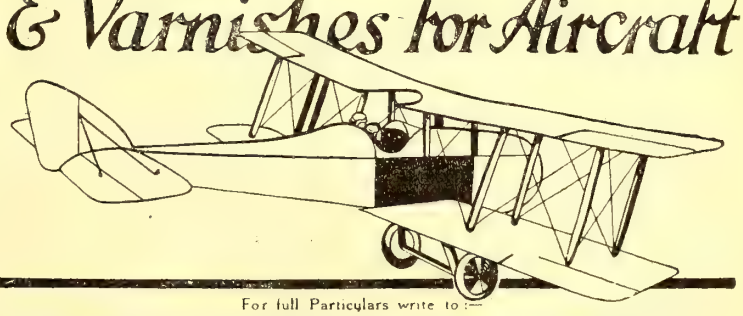

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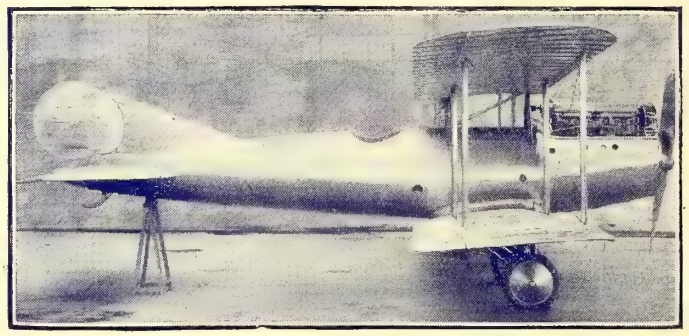

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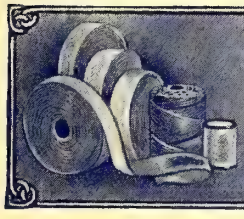

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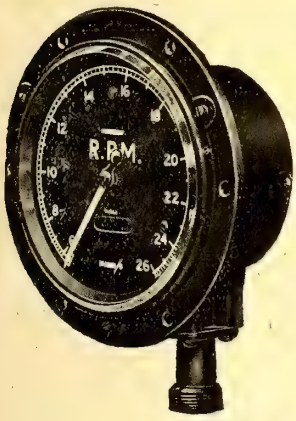

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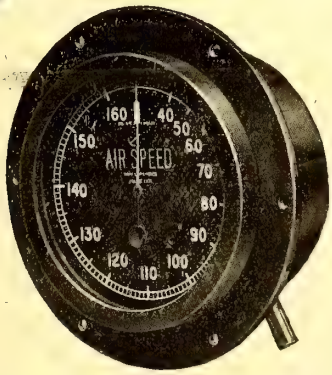

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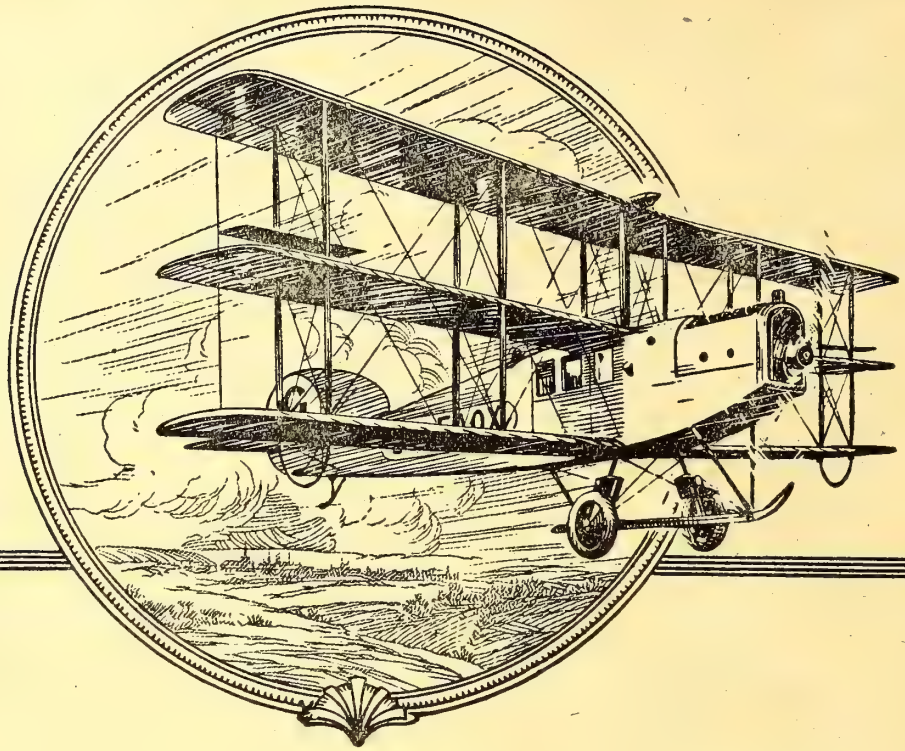

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Nov. 10, 1920.

THE AEROPLANE

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ON THE NEEDS OF CIVIL AVIATION.—IV.

Many are the needs of Civil Aviation, brains and money, but chiefly brains, being the chief of these. Already enough money has been expended without brains to have made Civil Aviation a commercial proposition in this year of grace if it had been spent intelligently. The trouble is that hitherto we have had wonderful pilots, wonderful designers, wonderful engineers, wonderful scientists, and all kinds of wonderful people—even fearful and wonderful journalists—concerned with and for Civil Aviation, but nary a business man, even of the most ordinary sort.

Certainly one of the crying needs of Civil Aviation at the moment is the advent of a few plain, commercially-minded individuals with a lot of business experience, a solid belief in air transport, and a little imagination, to organise commercial flying on a businesslike system. As things are one cannot even get at costs with anything like accuracy. And if costs cannot be shown convincingly on a prospectus or a balance sheet, how can the vulgar necessary capitalist be expected to finance adventures in Civil Aviation.

A Simple Question.

Here, for example, is a simple little question to which one would like to receive answers from people who fancy themselves as being knowledgable on the subject of aircraft. *What is the life of an aeroplane?*

If you ask that question of a dozen people, all more or less closely concerned with aviation, ten will probably give you some sort of an answer *in flying hours*. The other two will either give you an answer *in miles*, or they will reply with another question, as to whether you mean that the machine is in use all the time or whether it is kept in store.

Personally, one is convinced that it is altogether wrong to measure an aeroplane's life in flying hours, for—barring crashes—flying hours have nothing whatever to do with its life, except that perhaps they prolong it. At any rate, people who have had a great deal to do with operating aeroplanes hold that the wood-work in a machine which is used regularly and is kept in proper trim does not deteriorate so quickly as the wood-work of a machine which lies in store unattended. And they also say that when a machine is used regularly there is less chance of rust damaging the metal parts, for then they are kept properly greased or painted, whereas in store they cannot possibly receive the same attention.

What is Depreciation?

During the war it was generally assumed that the life of an aeroplane was about three weeks. That is to say, the whole of the machines in use in the Flying Services had to be replaced about seventeen times per annum. But in that case the calculation was based on the new machines needed to replace those lost over the lines and crashed in forced landings and in training. It had nothing to do with the actual depreciation of the machines in use.

There are plenty of cases to be discovered of machines which apparently do not depreciate at all. There was, for instance, the famous Deperdussin, built by Mr. Koolhoven for the Military Trials in 1912, flown by the late John Porte in 1912 and 1913, kept in store through most of 1914, commandeered by the R.N.A.S. at the outbreak of war, flown constantly by the late Air-Commodore Groves (then a Commander, R.N.) throughout 1915, and still going strong when crashed by a pupil late in 1916.

There is the more modern instance of the old N.10 Fairey, built in 1917, used for all sorts of Service flying and experimental work in 1917 and 1918, bought in as "disposal" scrap in 1919, used as a racing, experimental and competition machine in 1919 and 1920, and still as good as ever, or perhaps rather better. She is standing evidence of Mr. Fairey's claim that there is no depreciation to be written off against a properly built aeroplane constructed of sound material.

At the Etampes aerodrome, just before the Gordon Bennett Race in September, the old-timers received a shock which made them think they had gone back to pre-war days, for suddenly out of the sky there dropped an ancient Blériot, of the 1912, two-seater, 80 h.p. type. It had toured over from Buc to see the fun. Nobody discovered its history, but there it was, apparently as good as ever, and a living witness to the longevity of aeroplanes when not used in battle.

Doubtless many similar cases can be mentioned by others who have had the handling of aeroplanes during the past ten years or so. And in the face of such evidence who is going to say that the life of an aeroplane is to be measured either in flying hours or in years of existence?

And What is Obsolescence?

In a recent note in this paper on that excellent paper on depreciation which was issued by the Canadian Air Board—which is about the most practical and keenly alive institution of its kind in the world—Captain Sayers argued that even obsolescence is no basis on which to write off a charge against an aeroplane, at any rate as a running expense. As he showed, a given aeroplane with a given engine is just as well able to earn a given amount of money ten years hence as it is to-day, provided that it is kept in proper condition.

It may be out of date, and newer machines of different design may earn more money, so that it may pay to scrap the older type. The cost of scrapping it should, according to Captain Sayers, be provided out of a reserve fund taken from its profits, but should certainly not be charged as a running expense.

Therefore one cannot even say that the life of an aeroplane is to be measured in years because after so many years it will be obsolete. One might as well argue that a car should be written off on account of age, yet many experienced motorists would rather have a good car which is ten or fifteen years old than most of the post-bellum cars, which seem to be compounded of lead and assembled by plumbers.

The Determining Factors.

Apparently, therefore, the life of an aeroplane depends on two things. Firstly, its chance of being crashed by sheer unavoidable accident or by bad piloting; and secondly, by deterioration, caused by bad storage or bad treatment while in use—that is to say, inefficient mechanics or insufficient attention to adjustments, re-doping, re-painting, and so forth.

Freedom from crashes depends on the selection of pilots by the air transport firms and on the care taken of the machines and engines by the ground personnel of those firms. The record of the cross-Channel lines during the past year shows how astonishingly good these pilots are. And a slight knowledge of their work increases one's respect for them, for, in fact, the freedom from crashes on these lines reflects even more credit on the pilots than on the ground personnel. On which subject one hopes to say more at a later date.

The care taken of the machines by the ground personnel depends primarily on those who manage the air lines, secondly on the Aeronautical Inspection Department of the Air Ministry, and thirdly on the Air Council, which decides how much power and how much money may be given to the A.I.D.

Also, to a lesser degree, freedom from crashes depends on the ground organisation established by the Department of Civil Aviation. The provision of safe aerodromes, from which machines can depart and on which they can land safely: the establishment of proper weather observation posts along the air routes: the proper working of wireless telephones and the prohibition of interference by concerts and recitations: and the efficient working of ground signals, depends on this Department.

A Matter of National Interest.

It seems, therefore, that the basis on which the life of an aeroplane should be calculated is neither hours of existence, nor hours in the air, but purely its chances of being crashed or being allowed to deteriorate. And these chances will become less and less as pilots gain experience and as commercial ground personnel and Air Ministry ground organisation improve.

Such chances seem to be the affair of the actuaries of insurance companies rather than matter for calculation by business men or engineers. None the less it would be interesting to have the views of those who have had to do with the handling of aeroplanes.

The subject is, in fact, one which must be of considerable interest to the Supply Department of the R.A.F. as well as to air transport firms. In these days, when Government votes for the Air Force are almost as exiguous as the financial support of capitalists for the air lines, the question of replacing machines in the R.A.F. is of very considerable importance, both to the pilots who have to fly them and the taxpayers who have to buy them.

Therefore a fair estimate of the life of an aeroplane, and the setting forth of a fair method of estimating that life beforehand, is not merely one of the needs of Civil Aviation, but is, one imagines, a need of the R.A.F. as well. It is, in fact, a matter of national interest, and consequently anybody who will make any suggestions on the subject will be doing a service to the progress of aviation.

Such suggestions need not necessarily be in the form of hard and fast rules, they may even take the form of argument for or against the present system of calculating by flying hours or by mileage—which amounts to much the same thing. Instances of long-lived aeroplanes will also be of interest, as showing that machines are not as delicate or fragile as some people believe. The log-books of some of the cross-Channel liners would, one believes, be quite illuminative.

Betting Odds and Insurance.

Merely as an example one suggests that some sort of percentage basis might be evolved from existing knowledge of the life of aeroplanes. All insurance business is a species of betting. If an insurance firm demands a one per cent. premium on an accident policy it is merely betting a man 100 to 1 that he does not meet with that accident while the policy lasts. If it demands ten per cent. then the price is shortened to 10 to 1.

Possibly some of the bright young aviators who are now men of importance in the world where one insures, or tries to do so, may have views as to how to calculate the life of a commercial or Service aeroplane in terms of insurance. If so, their opinions will be gratefully received.

It is at any rate sure that if a satisfactory and easily understood method of calculating, discussing, or setting down on paper, the probable life of an aeroplane can be produced, it will help the financial progress of aviation quite considerably. And so it will help one of the chief needs of Civil Aviation.—C. G. G.

MORE POSTAL FOOLISHNESS.

It has been officially announced that the Air Mail Service between London and Amsterdam has been discontinued as from the end of last month because some people aver that fog would prevent the service from operating regularly. So far as one can gather, Holland is not much more subject to fog than is England, though perhaps during the winter bad visibility may be more common. One pilot at least, who has flown regularly on the Amsterdam route, says that he would have no hesitation himself in taking his machine through during the winter.

This pilot, incidentally, is strongly of the opinion that seaplanes should be used on the Amsterdam route instead of land machines, as it is possible to put a seaplane down and get off again practically anywhere between Belgium and Amsterdam, whereas, although a skilful pilot might in some cases put a land machine down without killing anybody, he would almost certainly damage the machine, and in any case would have a very small chance of getting off again if he once landed anywhere in Holland outside one of the very few aerodromes.

One gathers that the British Post Office is not to blame for the discontinuation. This is due partly to the fact that both British and Dutch air transport firms seem to funk running their machines on this line during the winter, and partly because the Dutch Government, either through sheer stupidity or for some subtle form of graft, puts every possible obstacle in the way of air post work, either with letters or parcels. And this despite, or because of, the fact that the September traffic was 100 per cent. greater than that of August.

A further example of postal stupidity is to be found in the fact that up to the present nothing has been done to develop a postal service with Scandinavia. Quite recently a friend in Stockholm sent two letters to this office, one by Air Mail to Copenhagen and the other by the ordinary boat service. Although the Air Mail only went as far as Copenhagen and the letter was not brought right through *via* Amsterdam by aeroplane, that letter arrived two days before the letter sent by the other route.

In consequence a letter was sent from this office to the Secretary of the General Post Office asking what arrangements had been made or were being made for the sending of letters from this country to Scandinavia by Air Mail throughout. The following reply was received :—

"Sir,—With reference to your letter of the 11th inst., I am directed by the Postmaster-General to inform you that, when the Air Mail Service between Amsterdam, Copenhagen and Malmö was instituted recently, full consideration was given to the advisability of using it in conjunction with the Air Mail Service from London to Amsterdam for the transmission of Air Mail correspondence from this country to Denmark and Sweden.

It was found that, under favourable conditions, the Service offered some ostensible advantage in point of speed over the ordinary Mail Services to Copenhagen and Malmö, but that, in view of the difficulty of maintaining a regular service by aeroplane to the place in question during the winter season, it was doubtful whether in actual practice the new service would afford any real advantage.

Moreover, it is probable that the London-Amsterdam Service will not be maintained during the winter season. It was decided, therefore, to defer offering the use of the service to the British public for the transmission of air mail correspondence posted in this country until experience of the working of the service in the inward direction had been gained.

In the meantime, as you are probably aware, the Swedish Post Office has decided, in view of the unfavourable weather conditions, to discontinue the dispatch of mails to this country by air.

Letters for Germany, Denmark, Norway and Sweden may be sent by Air Mail as far as Brussels for onward transmission by the ordinary Mail Service, often with the advantage of a later posting. (Signed) L. SIMON
(For the Secretary)."

The only consolation to be derived from this is the knowledge that the Swedish Post Office is as unenterprising as others. Which only seems to show that both we and our Scandinavian cousins have deteriorated considerably since the days when the Scandinavian pirates raided the coast of Britain regardless of weather. One does not imagine that King Canute postponed the raid which resulted in his becoming King of England because he did not like the look of the weather.

Apparently, therefore, we must console ourselves with the idea that when we are writing to our Teutonic relatives, either in Germany or Scandinavia, the Air Mail will only assist us as far as Brussels.—C. G. G.

A COMMERCIAL AIR RACE.

One believes that for some weeks past a spectacular air race has been under consideration by the Competitions Committee of the Royal Aero Club. It is generally acknowledged that nothing would be gained at the moment by a race for purely racing machines even supposing that any firms would enter racing machines for anything.

In the French race for commercial machines from Buc to Croydon and back some ten thousand spectators turned up to watch the machines arriving, even though no advertising of the race was carried out apart from a few inaccurate statements in the Press. There were no arrangements made to amuse the spectators during the time and after the arrival and departure of the competitors. And yet everyone seemed thoroughly pleased with the day's amusement.

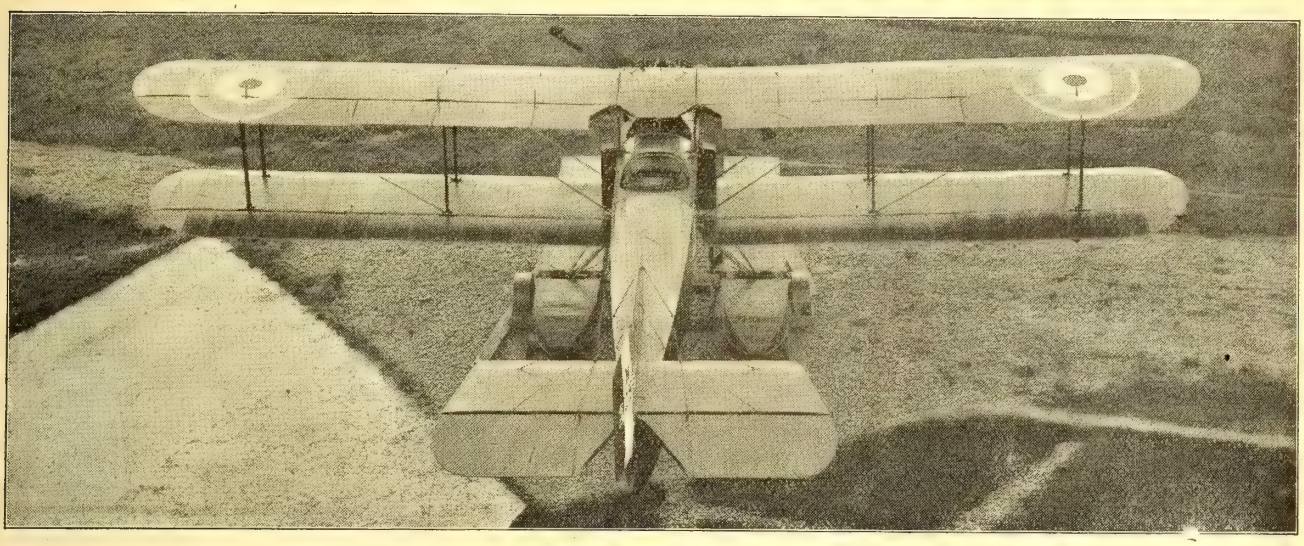
Therefore it seems that a race organised for commercial machines with a special prize for machines which actually run regularly on the usual air lines would prove a great success, besides which, if the publicity side was handled competently, it would give that advertisement to the hard-working air lines which is so necessary.

Handicaps would be given according to weight carried, and an event of this sort should be welcomed by the little group of sporting pilots who pilot machines day after day in all weathers on the set air routes to the Continent. Possibly they would enjoy it as a little excitement in the daily round, and they might be able to demonstrate the superiority or the reverse of their own pet course which they make on their respective routes. There would be no objection to machines carrying their usual cargo of paying passengers or paid-for freight in either direction.

A very good show could be put up by a D.H.9, D.H.16, and D.H.18, from A.T. & T., a "Vimy" and "Bat" from the I.A.L., a Westland or so from the A.P. of B., and an assorted array from H.P.T., Ltd. If foreign competitors were allowed, one might get a "Goliath," an F.50, a Spad, a Nieuport, a Breguet, and perhaps a Fokker.

Arrangements could be made for joy-rides and exhibition flying, or a Jamboree of sorts, while the competing machines were away, and it has been shown how easily a big crowd can be handled at Croydon. Suitable enclosures could be erected at a small cost, and, if arranged jointly by the Department of Civil Aviation and the Royal Aero Club, grist might be brought to the mills of both.—G. D.

THE GREAT WING QUESTION



To-day everybody is interested in the Question as to how much the Commercial Value of Aeroplanes can be improved by fitting Wings of Various and Variable Forms. Some of the New Wings are Reasonable Efforts towards Improvement, Others are mere Freaks. Above is seen the first Really Successful Attempt to produce a Variable Camber Wing. It was fitted to the Fairey Seaplanes in 1917, and was used with Great Success in 1918 and 1919. The whole trailing edge is pulled down, thus giving increased lift and making it possible to get off and alight at low speeds. As usual the Fairey was the first to achieve Success, and it still retains its Success in Practice, for these old Variable Camber Seaplanes of 1918-1919 are still in use and are giving Complete Satisfaction.

THE QUESTION OF DEPRECIATION DOES NOT ARISE IN ESTIMATING RUNNING COSTS OF FAIREY AEROPLANES EITHER ON LAND OR SEA, IN SERVICE OR CIVIL AVIATION

THE HISTORY OF A SEAPLANE (The Original No. 10).

She was designed in 1916; She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet early in 1919; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact and under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness as a Seaplane in the Summer of 1920; She has survived Nine Different Engines. In September, 1920, She competed in the Air Ministry Competition for Amphibian Aeroplanes, and put up a performance equal to that of the most modern flying-boats.

In all this work no Single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Unit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

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MILITARY

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Nov. 3rd.—Middle Euphrates.—Hostile concentrations south-east of Hillah were bombed by our aeroplanes on the 31st. Our machines were fired on, but no damage was done.

Nov. 5th.—Middle Euphrates.—Several hostile gatherings in the area S.E. of Kufa were dispersed by aeroplane attack on Nov. 1st and 2nd. On Monday one of our aeroplanes on reconnaissance was forced to land nine miles S.E. of Hillah. Another aeroplane, observing that an Arab band was approaching, landed and brought away the pilot and observer. The abandoned machine was burnt by the Arabs.

THE CASUALTY LIST.

Reported Oct. 11th.

Previously reported Missing, now reported Killed.—McNamara, Sec. Lt. J. C., R.F.C.

Wharram, Lt. C. E., R.F.C.

AIR FORCE.

REVISED SYLLABUS FOR R.A.F. ENTRANCE EXAMINATION.

The Air Ministry announced on Oct 19th, that the Air Council have approved of a revised syllabus of subjects for the Royal Air Force Entrance Examination, to come into force at the examination to be held in June, 1921.

The syllabus will be substituted for that shown in Appendix II of the Provisional Regulations respecting admission to the Royal Air Force (Cadet) College, after the November, 1920, Entrance Examination.

THE SUMMER MESS DRESS

The following memorandum regarding pattern of summer mess dress for officers of the Royal Air Force serving in India, the Middle East, and the Mediterranean was issued by the Air Ministry on Oct. 25th :—

It is notified for information that a summer mess dress has been approved for wear by officers of the Royal Air Force serving in India, the Middle East, and the Mediterranean.

The details are as under :—

Cap.—As for home full dress.

Jacket.—White drill without braid or buttons, stand-up collar, fastened at neck with loop of white cord. Detachable blue cloth shoulder-straps with rank badges as for home mess dress. One inside breast pocket, sleeves cut plain with pointed cuffs 5 inches high at point and 2½ inches behind.

Waistcoat.—White drill with round shaped opening, fastened with four small R.A.F. brass buttons.

Trousers.—White, home design.

Shoes.—As for home pattern mess dress.

Gloves.—White leather (kid) when worn.

Shirts.—Plain white soft-fronted shirt with stiff cuffs.

Collars.—Upright stiff collar, open in front, with turned-back corners.

Ties.—Black.

Socks.—Black.

Patterns of the jacket, waistcoat and trousers will shortly be available for inspection at Room 806, Air Ministry, Kingsway, W.C.2.

P. YOUNG, Squadron Leader,
For Director of Equipment

A Fatality in the Royal Air Force.

On Thursday, Nov. 4th, Flying Officers Harry Oliver Prout and Horace Edgar Fenwick were killed near Kenley on a Bristol Fighter. They had been to Winchester, and on their return they found the aerodrome enveloped in fog. It appears that they got into the Godstone Road valley, below the level of the aerodrome, and crashed into a tree on the side of a hill. Owing to the dense fog a salvage party of the Royal Air Force took over an hour to locate the wreck.

A verdict of "Accidental death" was returned at the inquest on Saturday, at which the coroner levelled some strong criticisms at the nature of the aerodrome. He remarked that he had previously held inquest on officers who had been killed in trying to land in the locality in bad weather. Flying Officer Salt sent a message to the deceased officers at Winchester advising them not to return owing to fog, but by the time the message was received they had already started to return.

The unsuitability of Kenley as an aerodrome has frequently been noted in this paper. One believes that it was originally chosen to be an aerodrome very largely because it was near the private residence of the officer who formed the park.

Engine Repair Shops' Dinner.

The first annual reunion dinner of the Engine Repair Shops' Association, the president of which is Wing Comdr. C. B. Hynes, D.S.O., is being held on Friday, Nov. 12th, at the Holborn Restaurant. Full particulars may be obtained from Flying Officer D. Drover, Directorate of Research, Room A 243, Air Ministry.

The Westgate Seaplane Base.

A reunion dinner of all old comrades of the Westgate-on-Sea Seaplane Base and Manston Aerodrome will be held at the Holborn Restaurant on Dec. 1st. Tickets can be obtained from Mr. T. S. Setterfield, 1, Cuthbert Road, Westgate-on-Sea.

The Western Aircraft Repair Depot.

A reunion dinner of the officers of the Western Aircraft Repair Depot, R.A.F., Yate, Gloucestershire, is arranged for Nov. 12th at 7.30 p.m., at Anderton's Hotel, Fleet Street. Particulars from R. G. Law Markham, Cromwell House, 33a, High Holborn, W.C.1.

IMPRESSIONS AT THE MOTOR SHOW.

Personally, one knows absolutely nothing whatever about motor cars. One can usually tell the difference between a Rolls-Royce and a Ford, chiefly by the looks of the occupants. If one sees a *very* nice car with *very* nice people sitting in it or standing near it, one knows it is a Napier. (N.B.—D. Napier and Son stood one a free tea on the opening day.)

The first day of visiting the show, visibility was about half of one's old friend the rod, pole or/and perch. This was owing to a very successful exhibit of fog, possibly shown by the Meteorological Department of the Air Ministry. From the gallery one had an excellent view of the lights twinkling in the murk.

The cars all looked very nice, though there was a lamentable lack of light blue cars, which one thinks are the best kind. The best one in the whole show was a scarlet one right in the centre of Olympia. One does not know the make, or whether it goes or not, but it certainly should not be missed by prospective customers, because with that colour it must be the best.

From what little one could see of the insides of the engines through little pipes on them, it would seem that they are painted much more prettily inside than out. Why cannot they be turned inside out? Also, all the airscrews are far too small, most of them being only a foot or so in diameter.

One thing one is glad to see, however, and that is the great advance the motor industry has made in looking after the comfort of possible passengers. Some of the cars on view at Olympia are very nearly as comfortable as aeroplanes. One is told that some of them are just as safe as aeroplanes, too, though their surface looks too small for slow landing. The Handley Page Wing system applied to the mudguards should get over this difficulty easily.

During one's tour of the show one met a business friend who desired to talk business, and, not being an exhibitor, and looking on Mr. Philips and the Society of Motor Mongers and Traffickers with the awe due to their august (adjective, not month) bodies, oneself and one's friend made our way outside the barrier of red tape, with which Olympia is entirely surrounded, and then returned to the Mart without a stain on our character. In fact we quite wore out the turnstiles with our consciences (a noun which is described to one as meaning "that which in a diseased state produces Malones").

What struck one also as being so awe-inspiring was the number of army titles on every stand. Each stand appears to be equal to a battalion headquarters, being commanded by a colonel usually, with at least two majors and some captains. On arrival at a stand one expected to be told to sign the arrivals book and report to the adjutant, and sign the departures book before leaving. In fact, one did see people signing books here and there; perhaps these were they. In view of their size and the present financial condition of everybody, they *cannot* have been cheque-books. One rather imagined that brigade headquarters were in the nice red car to which reference has already been made.

One is told that there is another part of the show at the White City. One will take the word of Mr. Philips and the S.M.M.T. for this. One visit to Olympia was enough to convince one that though the Aircraft Industry may be moribund, it is at any rate an improvement in the matter of personnel over the motor trade, in that it does not harbour those nasty parasites known as "agents."

Finally, to prove the triumph of the motor car over all other methods of transport, it took ninety minutes in an automobile taximeter cabriolet to go from Olympia to 175, Piccadilly, a distance not much in excess of two miles.

Meanwhile, aeroplanes are operating on all the air lines and elsewhere much as usual.—G. D.

A CHANGE FOR THE BETTER.

Apropos recent references in this paper to Signor Enrico Mario T. Casalegno (alias Woodhouse), it is interesting to learn that he is now no longer connected with those well-known American aeronautical papers *Aerial Age* and *Flying*. One gathers that the printers of these papers have now taken possession and that they will be carried on solely as newspapers and not as propagandist publications for Mr. Casalegno.

Mr. G. Douglas Wardrop, who has been Editor hitherto, remains as Managing Editor, and one feels sure that his enterprise and faculty for getting news with the least possible delay will result in a very considerable improvement in the papers now that he can devote to news space which hitherto he has been forced by the former proprietor to waste on purely political matter.

Mr. Charles D. Thomson, of Regent House, Regent Street, W.1, remains British Representative of these papers, to which one wishes every success in the future.

A SHOCKER.

The new serial in the *Evening News* is entitled: "The Trenchard Case." One ventures to suggest that this ought to have a big "boom."—G. D.

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THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIMEN.

No. 109, Oct. 16th, 1920.—Aerodrome List Amendments.

No. 110, Oct. 19th, 1920.—Meteorological Reports issued by W/T from Air Ministry and Aberdeen.

No. 111, Oct. 22nd, 1920.—France.—Aerodromes, Seaplane Stations, Customs and Wireless Stations.

No. 112, Oct. 22nd, 1920.—Belgium.—Aerodromes and Customs Stations.

No. 113, Oct. 23rd, 1920.—Blasting and dredging operations near Felixstowe. Warning to Pilots.

No. 114, Oct. 23rd, 1920.—Government Aerodromes. Prices of Aviation Spirit and Oils to Civil Pilots. Deals with current prices of petrol and oil at Civilian Aerodromes.

No. 115, Oct. 27th, 1920.—Blasting operations near Felixstowe. Warning to Pilots, Amendment to 113.

No. 116, Nov. 1st, 1920.—Aerodrome List Amendments.

No. 117, Nov. 4th, 1920.—Switzerland.—Customs, Aerodrome, and Seaplane Stations, etc. List, maps, descriptions, etc., of Customs, Aerodromes and Seaplane Stations in Switzerland.

No. 118, Nov. 6th, 1920.—Standard method of indicating bad ground at Aerodromes in Great Britain. Explanations and diagrams.

No. 119, Nov. 6th, 1920.—Lympne Aerodrome.—Night-landing arrangements. Explains the method of lighting and general rules and arrangements for night landing at Lympne Aerodrome.

CONTINENTAL ARRIVALS AND DEPARTURES.

[*The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.*]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

NOVEMBER 1st:

A.T.T., DH9, G-EAQN, London-Paris, 10.00-12.55, G.&M., 1, Reeves.
A.T.T., DH9, G-EAGY, London-Amsterdam, 11.30-15.17, G., 1, Hinchcliffe
M.A. Breguet, F-CMAG, London-Paris, 12.44-16.05, Nil, Nil, Martel.
A.T.T., DH16, G-EALU, London-Paris, 13.15-15.55, G.&M., 1, Carter.
A.T.T., DH18, G-EARO, London-St. Inglevert, 13.32-14.50, Nil, Nil, Armstrong.
G.E.A. "Goliath," F-GEAD, Paris-London, 11.34-13.52, G., 1, Favreau & 1
A.T.T., DH9, G-EAQN, Paris-London, 14.00-16.00, Nil, 2, Robins.

NOVEMBER 2nd:

A.T.T., DH16, G-EASW, London-Paris, 09.45-11.55, G.&M., 2, Forson.
A.T.T., DH18, G-EAUF, London-Paris, 13.12-15.20, G.&M., 5, Holmes.
A.T.T., DH18, G-EARO, St. Inglevert-London, 11.10-12.08, Nil, Nil, Armstrong.
M.A., Breguet, F-CMAF, Paris-London, 12.45-15.50, G.&M., 2, Le Sec.
A.P.B., Westland, G-EAMV, Paris-London, 13.00-15.38, G., Nil, C. Orde.
A.T.T., DH16, G-EALU, Paris-London, 13.15-15.50, G., 3, Reeves.

NOVEMBER 3rd:

A.T.T., DH16, G-EALU, London-Paris, 11.10-13.12, G.&M., 3, Tebbit.
G.E.A., "Goliath," F-GEAD, London-Paris, 11.18-14.15, G., Nil, Favreau & 1.
M.A., Breguet, F-CMAF, London-Paris, 12.33-15.50, G., 2, Le Sec.
A.T.T., DH9, G-EAOZ, London-Paris, 13.09-15.20, G.&M., 1, Robins.
A.T.T., DH16, G-EASW, Paris-London, 09.45-13.05, G., 3, Carter.
C.T., Nieuport, F-CGTO, Paris-London, 12.12-15.40, M., Nil, Mauler.

NOVEMBER 4th:

A.T.T., DH9, G-EAQL, London-Paris, 10.05-12.30, G.&M., Nil, Reeves.
A.T.T., DH18, G-EARO, London-Paris, 11.45-14.10, G., 7, Armstrong.
A.T.T., DH16, G-EASW, London-Paris, 13.12-15.45, G.&M., 3, Carter.
I.A.L., "Bat," G-EAPK, London-Paris, 13.22-16.00, G., Nil, Chattaway.
A.T.T., DH18, G-EAUF, Paris-London, 11.13-13.40, G., 5, Forson.
M.A., Breguet, F-CMAG, Paris-London, 13.15, Lympne, G. &M., Nil, Challoux.
A.T.T., DH9, G-EAOZ, Paris-London, 13.20, Biggin Hill, Nil, 2, Holmes
A.T.T., DH16, G-EALU, Paris-London, 13.40, Biggin Hill, Nil, 4, Robins.

NOVEMBER 5th:

Nil, Thick fog. No visibility at all.

NOVEMBER 6th:

A.T.T., DH16, G-EASW, Paris-London, 10.00-15.25/7th, G., Nil, Tebbit.
I.A.L., "Bat," G-EAPK, Paris-London, 11.05-14.02, G., Nil, Chattaway.
A.T.T., DH18, G-EARO, Paris-London, 13.30-11.45/7th, G., 4, Armstrong.
G.E.A., "Goliath," F-GEAD, Paris-London, 13.00-12.36/7th, G., 2, Labouchere & 1.
M.A., Breguet, F-CMAF, Paris-London, 14.15-12.50/7th, G.M., Nil, Le Men

NOVEMBER 7th:

A.T.T., DH18, G-EAUF, London-Paris, 11.00-12.10, G., 4, Holmes.
G.E.A., "Goliath," F-GEAD, London-Paris, 13.55-16.19, G., Nil, Labouchere & 1.
A.T.T., DH16, G-EALM, Paris-London, 11.15-13.42, Nil, 4, Reeves.

Where machines are reported arriving a day late it is owing to fog making the journey impossible, machines having to land at various places to wait for weather.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

NOVEMBER 1st:

H.P.T., HP, G-EATL, London-Paris, 11.55—, G., 6, Capps & 1.
H.P.T., DH9, G-EAUC, London-Brussels, 13.35—, G.&M., Nil, Fowler.
H.P.T., HP, G-EASL, Amsterdam-London, 11.00-14.12, Nil, Nil, Rogers & 1.
H.P.T., HP, G-EATN, Paris-London, 12.20-15.07, G., 3, Bager & 1.

NOVEMBER 2nd:

H.P.T., HP, G-EASL, London-Paris, 12.20-15.25, G., 3, Jones & 1.
H.P.T., HP, G-EATG, London-Brussels, 13.15—, G., 3, Hope & 1.
H.P.T., DH9, G-EAUC, Brussels-London, 12.00-14.15, G.&M., Nil, Fowler
H.P.T., HP, G-EASY, Paris-London, 12.35-16.20, Nil, 4, McIntosh & 1.

NOVEMBER 3rd:

H.P.T., DH9, G-EAUP, London-Paris, 11.40-15.10, G., Nil, McIntosh
H.P.T., HP, G-EAUC, London-Brussels, 12.30-15.00, G.&M., 1, Halliwell.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 12.30-14.50, G.M., 1, Rigaud
H.P.T., HP, G-EATH, Paris-London, 12.30-16.17, Nil, 4, Jones & 1.
H.P.T., HP, G-EATG, Brussels-London, 14.00-17.10, Nil, 1, Hope & 1.

NOVEMBER 4th:

H.P.T., HP, G-EASY, London-Paris, 11.32-15.30, G., 6, Fowler & 1.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 12.45-15.10, M., 2, Rigaud.
S.N.E.T.A., DH4, O-BARI, London-Brussels, 12.47, landed 14.30 St. Inglevert, G., Nil, Delzenne.
H.P.T., DH9, G-EAUC, Brussels-London, 12.30-14.47, G.&M., 2, Halliwell.
H.P.T., DH9, G-EAUI, Brussels-London, 13.30-16.00, Nil, Nil, Beal.
H.P.T., HP, G-EASL, Paris-London, 12.55-16.30, Nil, 3, Olley & 1.

NOVEMBER 5th:

H.P.T., DH9, G-EAUC, London-Paris, 11.45-14.20, G., 1, Jones.
H.P.T., DH9, G-EAUN, London-Cologne (via Brussels), 12.35-15.40 (Brussels), 14.25 (Cologne) 7th, Nil, 1, Hope
H.P.T., DH9, G-EAUI, London-Brussels, 12.30-14.45, G.&M., 1, Halliwell.
H.P.T., HP, G-EASY, Paris-London, 12.40-16.15, G., 6, McIntosh & 1.

NOVEMBER 6th:

H.P.T., HP, G-EATG, London-Paris, 12.50-16.10, G., 2, McIntosh & 1.
H.P.T., HP, G-EAMA, London-Brussels, 13.37-16.40, G.&M., 2, Olley & 1.
H.P.T., DH4a, G-EAVL, Pau (via Paris)-London, 13.20, (Paris)-16.10, Nil, 1, Foot.
H.P.T., DH9, G-EAUP, Paris-London, 13.20-16.15, G., Nil, Fowler.

NOVEMBER 7th:

H.P.T., HP, G-EASL, London-Paris, 13.30-17.70, Nil, 4, Bager & 1.
H.P.T., HP, G-EATG, Paris-London, 12.35-15.50, G., 4, Jones & 1.

Air Port Statistics.

	Croydon	Cricklewood	Total
MACHINES:—			
	35	29	64
PERSONNEL—Passengers:			
	62	66	128
Crews:			
	41	44	85
Total Passengers and Crews			213

Inland Flying at Croydon.

Nov. 1st to Nov. 3rd.—Nil.
Nov. 4th.—A.T.T., 1 DH9 test.
Nov. 5th and Nov. 6th.—Nil.
Nov. 7th.—I.A.L. "Vimy," 7 joy-rides, 94 passengers; 1 test.

Inland Flying at Cricklewood.

Nov. 1st.—H.P.T., O/400 test.
Nov. 2nd.—H.P.T., 2 O/400 tests; O/400 from Southfleet.
Nov. 3rd and Nov. 4th.—Nil.
Nov. 5th.—William Beardmore & Co., Ltd, W.B.2 from Glasgow.
Nov. 6th and Nov. 7th.—Nil.

(*Continued on page 775.*)

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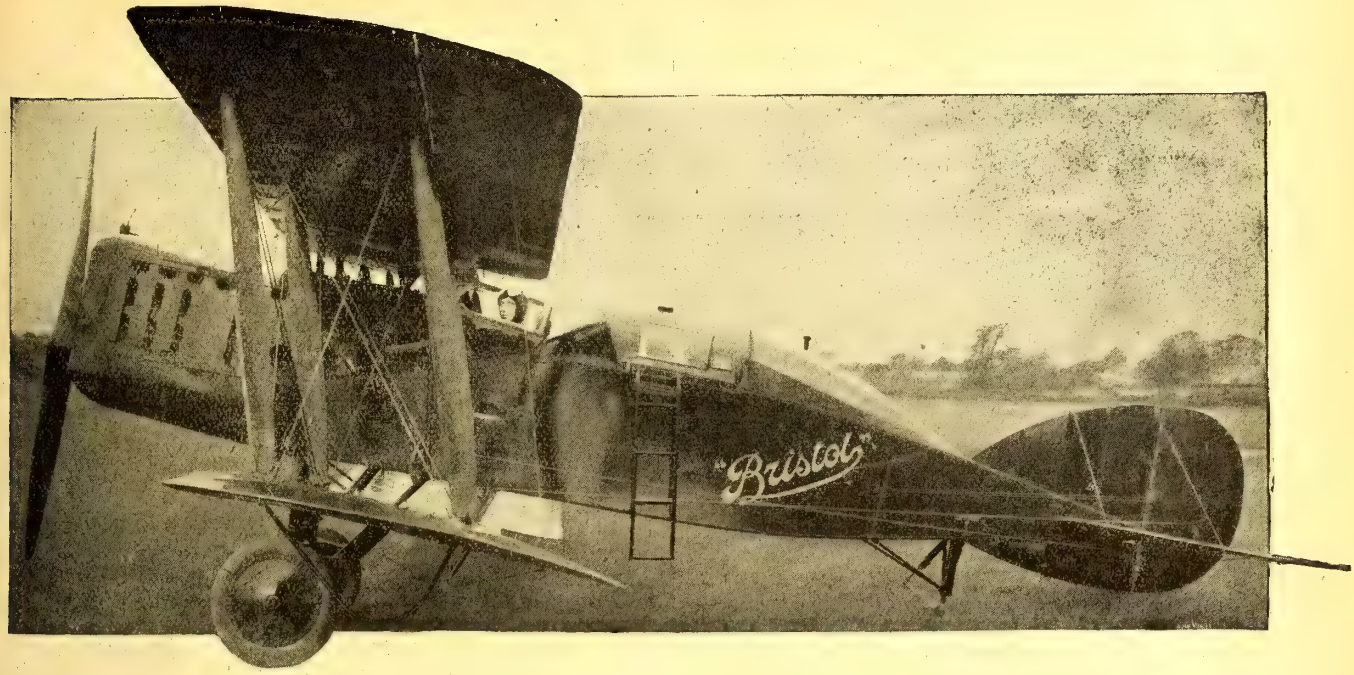

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THE WEEKLY COMMENTARY.

In aeronautical circles in this country the habit of free speech—and particularly free critical speech—has long been firmly established. The note published below on "The Gentle Art of Crabbing" points out that it is necessary when indulging this habit to consider carefully the company who may be within hearing.

Descriptions and illustrations of some interesting new aircraft of British, French and American origin appear in this issue. (Pages 760-764.)

The British machines are the Bristol seaplane and the two-seater Avro "Baby." The former shows how well a practically standard machine will perform on floats. The latter demonstrates conclusively the commercial possibility of making a satisfactory flying machine to carry a passenger with the 35 h.p. Green engine, which has already done such very fine work.

The opinions of certain American authorities on the merits of the Junkers six-seater monoplanes, which have been imported into the United States and there extensively advertised by their importers, appear on page 766. It is notable that American experience bears out the statement made in this paper recently that the risk of fire cannot be avoided by making a fireproof aeroplane, but only by using "fireproof petrol."

Herr Max Unz, in a further letter, reiterates his claim to have anticipated Colonel Holt's invention of the "pilot parachute" arrangement for aerial life saving. Mr. E. R. Calthrop points out, however, that the system was known prior to the patents of either Colonel Holt or Herr Unz.

THE GENTLE ART OF "CRABBING."

The name of that relatively harmless and succulent crustacean the crab has been diverted to so many strange uses that it is probably necessary at the opening of this essay to define the particular sense in which the verb "to crab" is here employed.

Therefore it may be stated here and now that for the present "crabbing" denotes the making of unfavourable detailed criticisms of the products of other people's hands or brains with a view to lessening their pride in their own works.

From the earliest days the art of crabbing has been practised with very considerable vigour by all those who have devoted their time to the practice of aviation in Britain.

"Crabbing" in the Past.

At Brooklands in pre-war days the appearance of any new machine or engine was invariably the occasion of a "crabbing campaign" carried on by the whole population of that place—except the parties responsible for the crabbed object—and devoted to a detailed exposition of all the errors of conception, design and construction which could be detected in that object by the combined ingenuities and imaginations of the attacking horde.

And Brooklands was not alone among the centres of aviation in this respect, nor has the habit of crabbing yet died out in aviation circles. Take any disinterested pilot and set him to fly a strange machine and demand his real opinion thereof, or ask any designer his private and candid opinion of the works of any other designer, and it will be found that crabbing is by no means a lost art.

And this is all to the good—provided that the crabbing is carried out in the right spirit and in the right way. As carried on by the pioneers of aviation in this country crabbing was a somewhat exaggerated criticism of design and construction, addressed as directly as possible to the party responsible for the object thereof, by those who possessed just claims to some measure of authority upon the subject of discussion, and this criticism was not published to the world at large.

It was rarely provocative of more than a temporary feeling of soreness on the part of those to whom it was addressed—if only because they in their turn had, and availed themselves of, the opportunity of crabbing back—and it provided, in fact, a direct incentive to continual progress in the design of aircraft and of engines.

Crabbing To-day.

To-day the directness of intercourse between competent critics and designers which held of old exists no longer, and in conseqence "crabbing" is fraught with dangers which were absent in the days before the war. There are still places where it is possible on occasion to explain, directly and in private, to the builder of a new type of machine the exact intensity of one's hatred of his methods of construction, but the opportunities grow rarer day by day, and crabbing has lost much of its old virtue in that it has become necessarily a less direct heart-to-heart affair.

Such criticism now generally passes from the crabber to the crabbed through round-about paths, and in passing may reach the ears of those who will make evil uses of it.

It is one thing for two capable designers to interchange destructive or derogatory comments upon each other's details of construction. Each knowing that the other knows that the machine or machines criticised are on the whole good specimens of their type, they neglect the good features and concentrate upon those wherein there is room for improvement. They "crab" each other's work, in fact, and are both the better for it.

When Crabbing is Unjustifiable.

But it is quite another thing if one expert criticises solely the demerits of a particular craft, and publishes that criticism to the world at large without a just and full appreciation of the countervailing merits thereof.

"Crabbing," in public, is only justifiable when used for the purposes of controversy, when the crabbed have their own opportunities of justifying their works. As an example the note which is published in this issue wherein Mr. Grover C. Loening expresses unfavourable opinions upon the design and construction of the Junkers monoplane, is in itself pure crabbing. But it is fair, although public, crabbing, because it is merely a reply to the claims publicly made for that machine by those who are commercially interested in pushing the sale thereof.

By itself it is not a fair statement as to the merits or demerits of the particular type of aeroplane, and were it advanced as a complete report upon the virtues and vices of the type it would properly be regarded as prejudiced. These considerations may be of some assistance to those people who are convinced of the entire dishonesty of all those who write for the Press, because they have observed that in their published writings they oft find good to say of articles for which in private conversation they have nothing but adverse criticism to offer.

Crabbing, and Public Criticisms.

Very largely this occurs because they assume in conversation that those to whom they are speaking realise, as they themselves do, the essential good points of the subject of discussion.

Speaking of an aeroplane they assume that it flies, that its controls function, that it is up to airworthiness certificate standards of strength and safety, and they confine their remarks to features wherein it falls short of their hopes.

But they know from bitter experience that it is not safe to make any such assumptions in writing for the public Press, and they also realise that the standards of to-day are not those of to-morrow, and that, if their criticism is to have any value to-morrow, it must state plainly the standard of actual achievement—or the realised merits—of that which they criticise, to give to the criticism any abiding value, and therefore it is no proof of any fundamental dishonesty if a writer should in conversation say that a certain machine, motor car or other article, is a horrible affair, and yet in print find it possible to ascribe to that article the possession of quite a number of virtues.

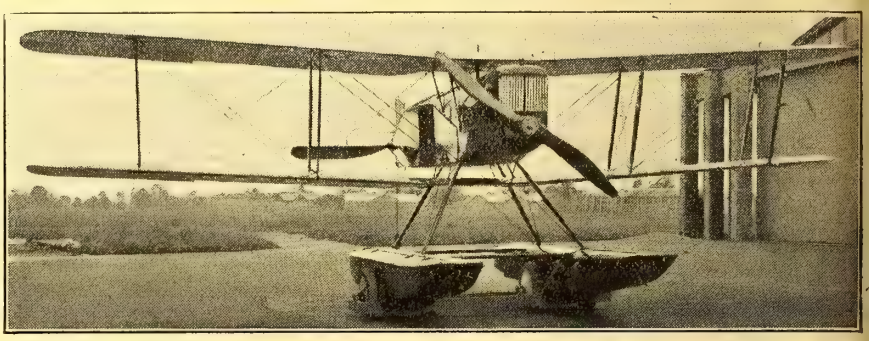
It is not necessarily fear of the law of libel, or care for the maintenance of his advertising revenue which dictates the difference between the written and the spoken word: it is, in fact, more often an honest effort to explain to the general reader the more obvious truths which he takes for granted when conversing with those who may also be assumed aware of them.

And it is not impossible that in this respect the journalist is often fundamentally more careful of the truth than are many of those who are most apt to reproach him. Crabbing has a habit of growing on those who practise it, and they oft indulge in it indiscreetly, before audiences unfitted to assess it at its true value. For "crabbing," to serve any useful purpose, requires from both crabber and his audience certain qualities of knowledge and of tact which are not invariably to be found in any company.—W. H. S.

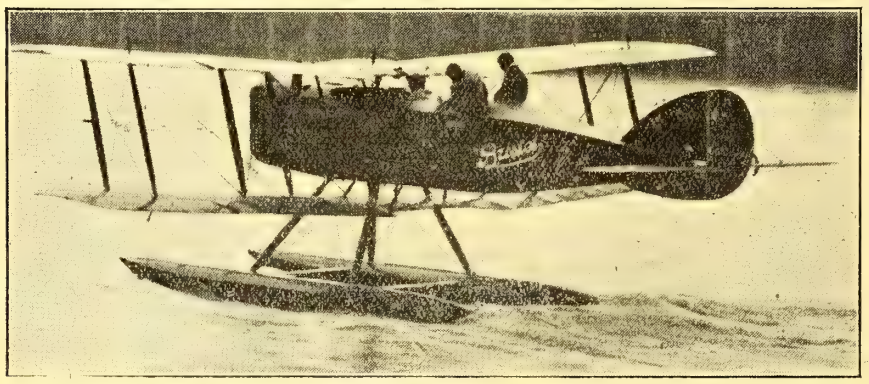
SOME INTERESTING NEW MACHINES.

THE "BRISTOL" SEAPLANE.

The "Bristol" seaplane here illustrated should make a considerable appeal to users of this type of craft from the fact that exceptional strength of construction has been made one of the chief aims of the designers. The machine is essentially the well-known Bristol "Tourer" on floats, and both two and three-seater models are constructed. The engine installed is the 230-240-h.p. Siddeley "Puma," fitted with dual ignition, and petrol tanks with a capacity of 70 gallons are carried.



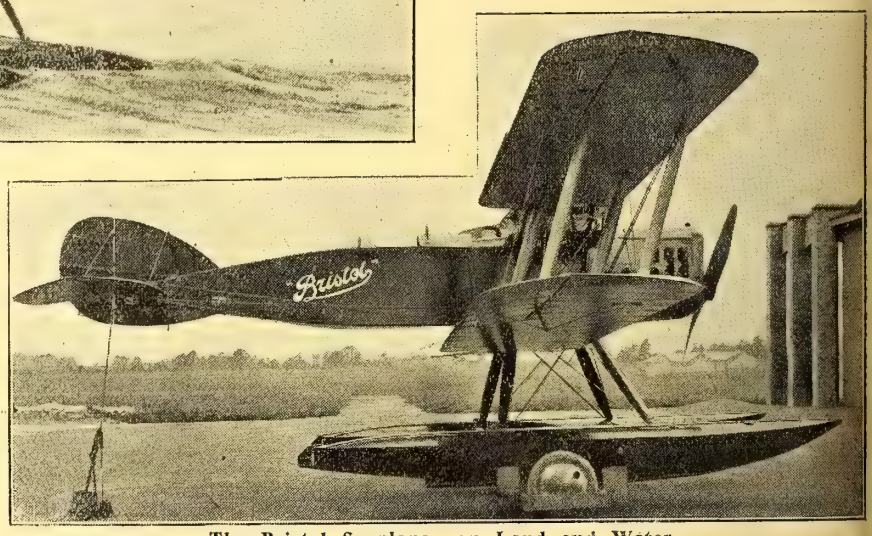
The floats are deserving of special interest. They are 19 ft. 6 in. in length, of "V"-bottomed design, and each is divided into six watertight compartments. Each float weighs approximately 200 lb. They are constructed with an internal skeleton which forms a complete structure in itself, apart from the covering of the sides and bottom. The skeleton consists of three main members comprising two lower longerons and a single central top longeron, together with the requisite inter-connecting struts and bulkheads. Along the whole length of the floats a walking-way is provided, and there are also attachments for towing-lines.



Twin water-rudders at the tails of the floats are actuated from the main rudder-bar and, moving with the air-rudder, give excellent control when on the water. The length of the floats is such that the machine rides approximately in flying attitude under all conditions, no tail float being necessary, and the space between the floats is so wide that wing-tip floats are unnecessary.

The buoyancy of the floats is such that a machine has actually been manœuvred successfully on the surface after two compartments of each float have been holed. The floats are detachable so that for stowing purposes the machine may stand upon the undercarriage and the removal or replacement of floats can be effected without interference with the bracing wires.

Under actual test a machine of the three-seater type performed admirably on the water and took off on a perfectly calm day after a run of less than 400 yards. At this time the machine was carrying a full load of two heavy passengers and some 40 lb. of ballast.



The Bristol Seaplane on Land and Water.

THE TWO-SEATER AVRO "BABY" TYPE 543.

A two-seater biplane has just been produced by A. V. Roe and Co., Ltd., which is a development of the Avro "Baby" (35 h.p. Green) that, during the past eighteen months, has put up such really extraordinary performances, including the non-stop flight from London-Turin in 9½ hours, which flight was continued to Rome, then back across the Gulf of Genoa to Nice-Lyons-Paris-Southampton. The petrol consumption on this tour worked out at 30 miles to the gallon, with an average speed of 65 m.p.h.

It will thus be seen that the design on which the two-seater "Baby" is based is very sound, and the results of the recent tests have proved that it is in every way an excellent development of its prototype.

In general outline there is no marked difference between the single- and two-seater models, except that the cockpit has been lengthened, the passenger sitting close up behind the pilot, and the engine has been placed farther forward in order to balance the weight of the passenger. From a series of tests carried out at the Hamble aerodrome of A. V. Roe and Co., Ltd., the machine has proved itself to be remarkably

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Extract from THE GLOBE, Dec. 16, 1919.

"The fact remains that it was the internal combustion motor that made flight possible, and the Rolls-Royce motors in particular that enabled these two glorious conquests of the air to be achieved. The Rolls-Royce car is famed throughout the World as a pattern of reliability, but the Rolls-Royce aero engine has now put the coping-stone on the previous successes of the firm, and so noteworthy a double performance is practically without parallel in the history of the world."

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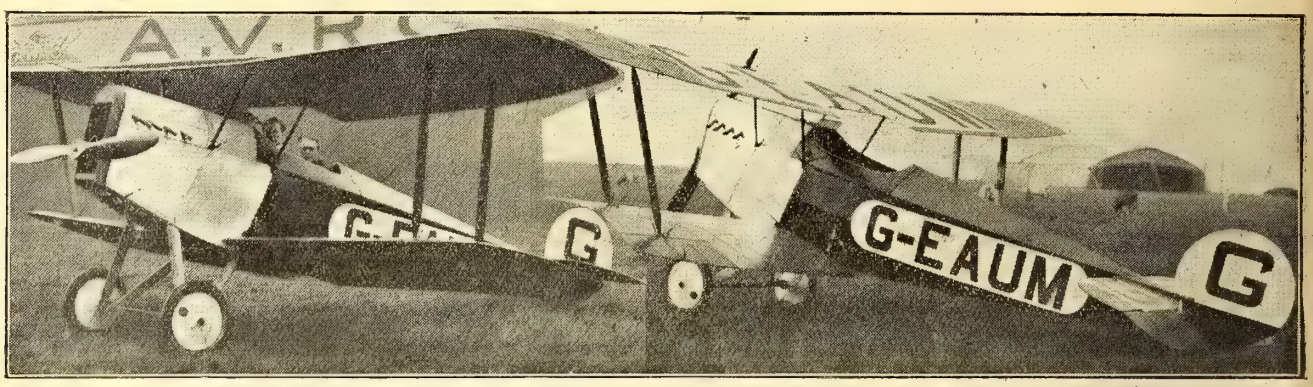


Two Views of the New Two-seater "Baby" Avro (35-h.p. Green Engine).

efficient, and the ease with which it can be landed in and flown out of small fields makes it particularly suitable for cross-country flying. The controllability is excellent, the machine being light and quick on its controls not only low down but also at high altitudes. It has shown itself to possess a marked degree of inherent stability, and has been flown for considerable periods without any control on the part of the pilot. Flown "solus" the machine can perform all the stunts which are expected of modern machines.

The construction is perfectly straightforward, many standard Avro parts being used, therefore it seems hardly necessary to give a detailed description of the machine other than what is included in the following specification :—

Span of top plane	25 ft.	Length	20 ft.
Span of bottom plane	23 ft.	Height	7 ft. 6 in.
Chord	4 ft.	Span of tail	7 ft. 6 in.
Gap	4 ft. 3 in.	Area of planes and ailerons	176½ sq. ft.
Stagger	1 ft. 6 in.	Area of tail and elevators	21 sq. ft.
Angle of incidence	4½ deg.	Weight loaded	970 lb.
Dihedral	3 deg.	Useful load	340 lb.
Weight empty (with water)	630 lb.	Load per sq. ft.	5½ lb.
		Weight per h.p.	24.2 lb.
		Petrol capacity	8 gal.
		Oil capacity	1½ gal.

The following performances are obtained from the average of a number of test flights carried out at Hamble, Southampton :—

Maximum speed (sea level)	82 m.p.h.	Duration (cruising at 1,000 ft.)	3.2 hr.
Landing speed	40 m.p.h.	Cruising range	225 miles
Cruising speed at 1,000 ft.	70 m.p.h.	Petrol consumption (cruising at 1,000 ft.)	2½ gal. per hr.
Climb to 1,000 ft.	2½ min.	Ceiling	12,000 ft.
Climb to 5,000 ft.	13 min.	Speed at 6,600 ft.	77.5 m.p.h.
Climb to 10,000 ft.	35 min.	Speed at 10,000 ft.	72.5 m.p.h.

SOME RECENT SPAD MACHINES.

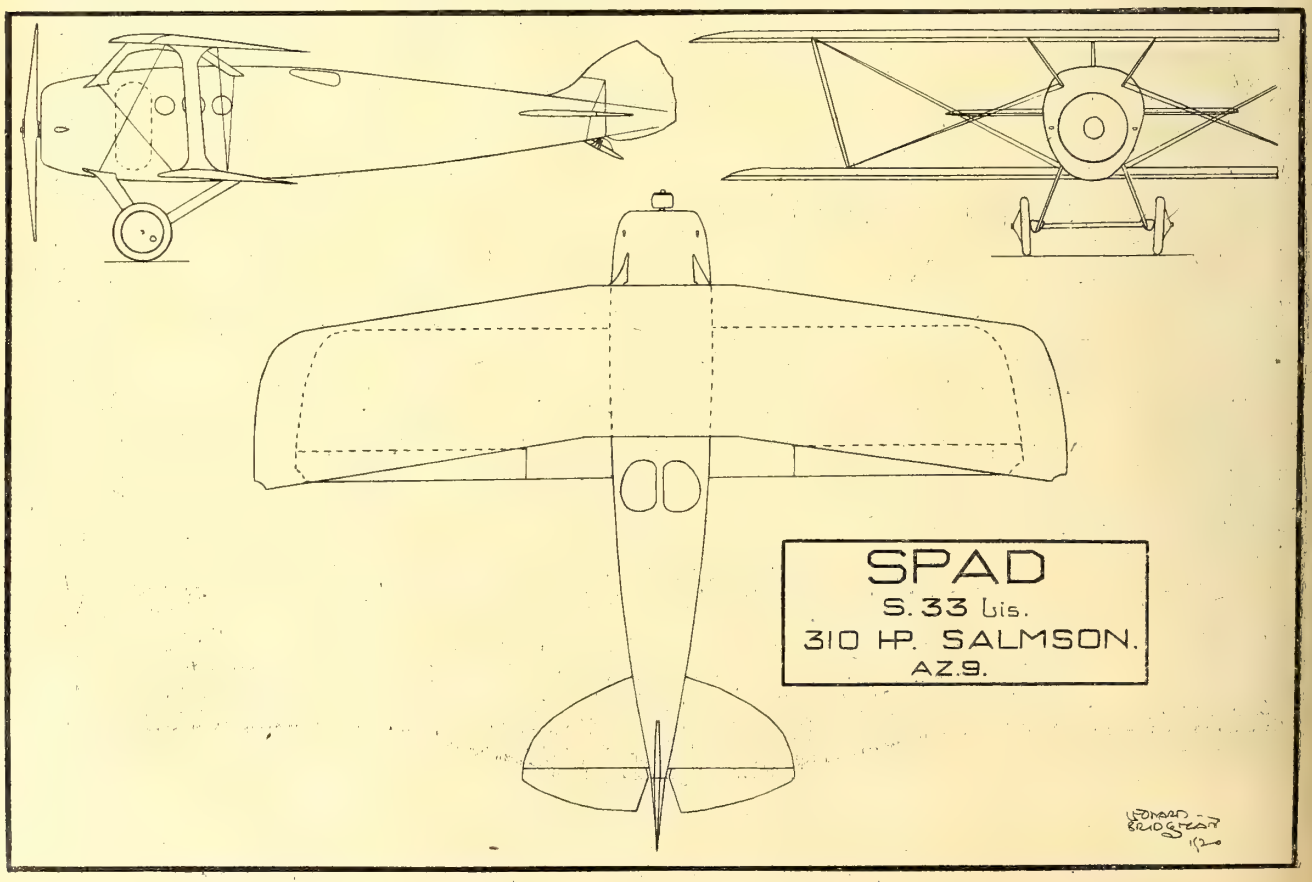
Since the beginning of the year a considerable number of machines have been designed by M. André Herbemont, and constructed by Blériot Aéronautique, of Surèsnes and Buc.

In January, 1920, two machines, the S.29 (80 h.p. le Rhône) and the S.30 (45 h.p. Anzani) single- and two-seater sporting biplanes, respectively, appeared. In February the S.28 bis (300 h.p. Hispano-Suiza) was turned out. For the Monaco Rallye two hydroaeroplanes, the S.26 bis and the S.31, were constructed.

Now, towards the end of the year, a good number of interesting machines are being listed or are coming through the shops. The S.32, fitted with a 200 h.p. super-charged Damblanc-Mutti, is being got ready to attack the height record. The S.33 bis (310 h.p. Salmson A.Z.9), an eight-seater limousine, was flying at the recent Buc Meeting.

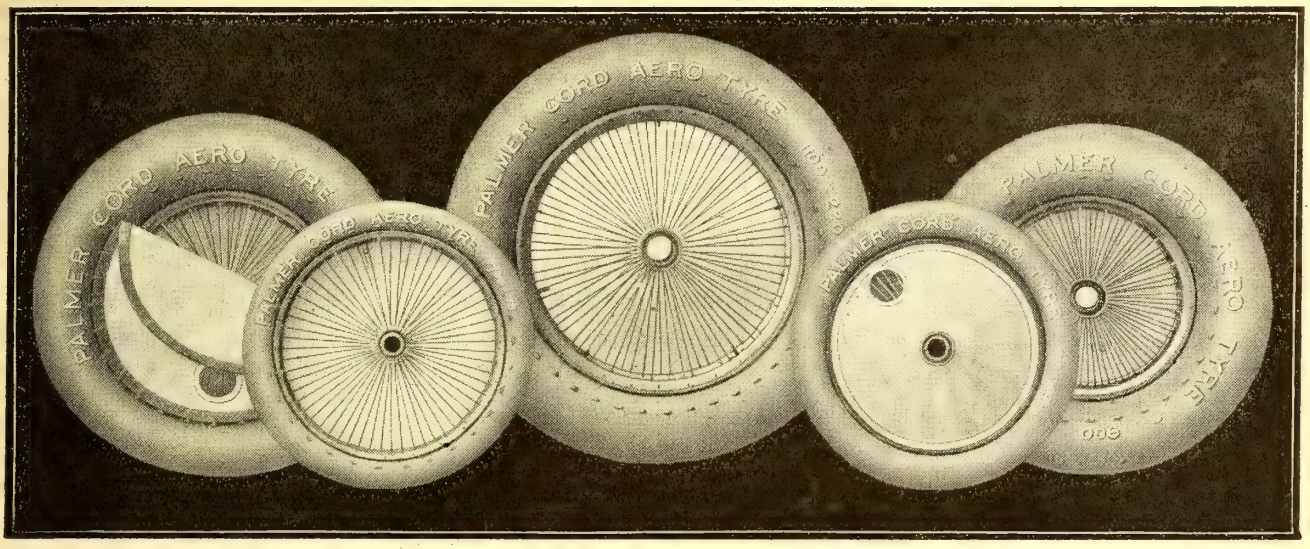
The S.34 (80 h.p. le Rhône), designed specially as an instructional machine, has just been turned out. The pilot and pupil are seated side by side. The machine has been specially designed with regard to ease of replacement and repair.

The following are a few brief particulars :—



PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132 46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135/50
,,	*40	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

** Wheels No. 36 and 40 are of stronger type than the other wheels for 800 x 150 tyres.*

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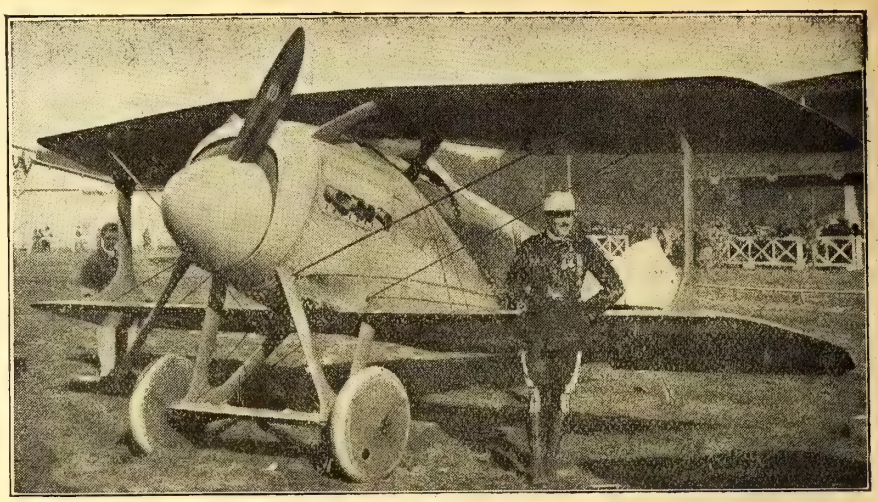
LJD/NE.

THE SPEED RECORD SPAD.—The 300-h.p. Hispano-Suiza-engined machine whereon Capt. the Count de Romanet has been competing against M. Sadi Lecointe for the world's speed record. The machine is practically identical with the Gordon Bennett Cup "Spad" shown in a scale drawing below, except that the top plane is mounted on a centre section and is flat, instead of dropping to the fuselage itself. The spinner of the airscrew, apparently blocking out the greater portion of radiator surface, is another difference. The breakage of this pot on a recent flight nearly led to a serious accident.

On Nov. 5th Capt. de Romanet attained a speed of 193 miles per hour.



Surface	20.2 sq. m.	Weight (empty)	370 kg.
Length	6.4 m.	Weight (loaded)	590 kg.
Span	8.5 m.	Speed (max.)	130 km.p.h.
Height	2.36 m.	**Speed (min.)**	50 km.p.h.

The S.35 (180 h.p. Hispano-Suiza) a single-seater fighter, is being built specially for the Chilean Government.

A special machine, the S.37 (275 h.p. Marine type Hispano-Suiza) is being specially designed for the Messageries Aériennes, based on the experience gained from the S.27, which has been operating on the London-Paris service for nearly a year, and which won the Buc-London-Buc race at the recent Buc Meeting, piloted by M. Bourdon. The passengers are placed in a cabin situated under the wings. The passenger seats are easily removed so as to allow of the transport of goods and mail.

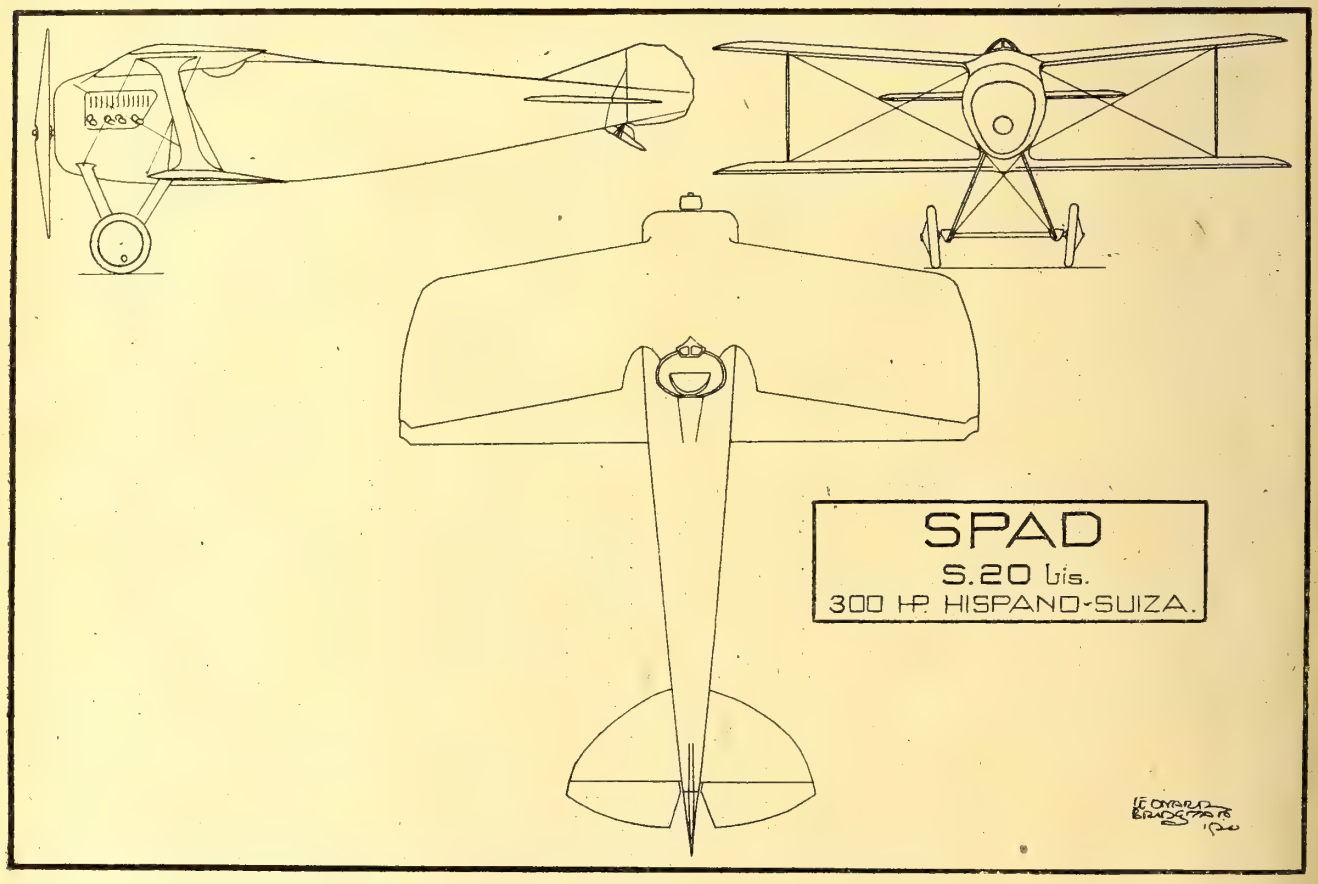
Specification of the Spad 37.

Surface	32.5 sq. m.	Span	10.42 m.
Length	7.5 m.	Height	2.8 m.
Weight (empty)	900 kg.	Speed (min.)	100 km.
Weight (fully loaded)	1480 kg.	Factor of safety	7
Speed (max.)	225 km.		

In the official trials for the S.T.Ae. this machine carried a load of 716 kg. and climbed to a height of 4,500 m. in 40 min.

Other machines being constructed are the S.36 (300 h.p. Hispano-Suiza-Rateau) two-seater fighter for the French Army, the S.38 and S.39 for the French Navy, and a ten-seater limousine fitted with a 450 h.p. Napier "Lion."

In addition to the above are the two machines used in the Gordon Bennett Race and at the Buc Meeting respectively, on which MM. Casale and de Romanet performed brilliantly.



A NEW CURTISS "EAGLE."

The Curtiss Aeroplane and Motor Corporation, of Garden City, L.I., have recently turned out a single-engined biplane, capable of carrying ten people, including pilot, which is, to all intent and purposes, a modification of the earlier 3-Curtiss K6-engined and the 2-Curtiss K12-engined biplanes. The new "Eagle" has the same overall dimensions, the appearance differing only in that there are no wing engines, the power plant—a 420 h.p. Liberty—being carried in the nose. It possesses a very good performance all round, having a top speed of 105 m.p.h., a cruising range of 10 hours.

At one of the recent trial flights the machine carried a useful load of 3,533 lb., with a weight empty of 4,243 lb.

The principal characteristics of the new "Eagle" are as follow :—

Span	61 ft. 4 in.	Useful load	3533 lb.
Height	12 ft. 4 in.	Speed, maximum	105 m.p.h.
Overall length	36 ft. 9 in.	Speed, low	50 m.p.h.
Weight, empty	4243 lb.	Ceiling, full load	10,000 ft.

BEARDMORE

AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

THE JUNKERS MONOPLANE IN AMERICA.

The importation into the United States of a number of Junkers all-metal monoplanes and the use by the American Post Office of some examples of the type for mail carrying has aroused a certain amount of feeling in American aeronautical circles, a feeling not altogether assuaged by the recent fatal accident to one of the Air Mail machines of this make.

One journal has collected the opinions of technical officers of the Navy, of the Army Air Service, and that of Mr. Grover C. Loening as to the merits of the Junkers type of machine.

The Naval view is that, although the tests on the machines which the Navy has purchased have not yet gone far enough to make a definite pronouncement as to the merits of the type, they are satisfied that, both structurally and aerodynamically, the design is of the greatest merit and originality.

The carrying capacity, endurance and speed are much more than could be expected of a conventional aeroplane of equal power.

The low power involves long runs taking off and a slow climb, and the machine is easy to stall if not handled with respect, and at present it demands too high a quality of landing ground for general commercial work. It is believed that these features can be overcome, and that the low power is a feature, not a defect.

The fuel system—from a fire prevention point of view—is not good, but this can be corrected.

The Army Air Service view—coming from the Engineering Division at Dayton—is similar as regards absence of test data sufficient to substantiate positive assertions. But they are emphatic that with the B.M.W. engine as installed the fire danger is great, but that this can be cured. (It may be assumed, therefore, that the trouble is entirely one of installation.)

They do not regard the type as an experimental one, but they do not know very much about its qualities. It has not been sandloaded, but they doubt if the factor of safety is decidedly better than that of present types.

It is less susceptible to climatic variation than the usual machine. It is not particularly easy nor peculiarly difficult to fly. Performance tests are incomplete, but they are able to state that the reports which have been published appear to be exaggerated. The performance is, however, somewhat better than that of normal machines of equal weight per h.p.

Mr. Loening ascribes all the merits of the Junkers to the B.M.W. engine, whose reliability and low fuel consumption account for the performance.

He states that the machine is unstable and difficult to handle unless the engine is at full power, and that he believes the factor of safety to be less than that demanded from existing American types. He criticises the action of the Government authorities in accepting and using these machines without imposing the strength tests to which all American designs are subject. At the same time he states that he believes that the factors of safety demanded by the Government are unnecessarily high, but that this is no excuse for differentiating in favour of machines of enemy origin.

On the strength of statements made by those having actual experience with the machines in Government service, he says that they do not display any unusually good qualities in regard to durability. The metal covering is said to be as liable to injury as fabric, and injuries to it are more vital than in the usual case, as the covering is part of the structure. In addition the covering is said to be difficult to repair.

Mr. Loening considers that the machines should be regarded as purely experimental, and that from that point of view the purchase of the type for test purposes is justified, but the use of them on postal services is not justified.

As a type he considers that the Junkers is not new, and cites the 1912 Antoinette as a prototype.

In particular he considers that the newspapers which have published the usual journalistic exaggerations are to blame for having given an entirely unjustified notoriety to the Junkers machines, and for giving the impression that it represented an advance with which American designers could not compete.

Personally he finds nothing of any value in the design except the engine, and that the value of this is discounted by the fact that it requires a special grade of benzol and cannot be run on ordinary spirit.

[In this last respect Mr. Loening appears to be misinformed. Tests on the B.M.W. engine made in this country indicate that the low fuel consumption can be attained with ordinary aviation spirit. It is just possible, however, that benzol, owing to the absence of pre-ignition, may permit the B.M.W. engine to run continuously at higher power than can be reached with petrol, and that the six-seater type Junkers depends for its performance on running the engine overloaded.—W. H. S.]

THE ROYAL AERONAUTICAL SOCIETY.

The first of the 1920-21 session's ordinary meetings of the Royal Aeronautical Society was held at the Royal Society of Arts on Thursday, Oct. 21st. Under the new arrangement, the meeting opened at 5.30 p.m., the papers dealt with were read in very brief abstract, and, despite the closing hour of 7.15, considerably more time was available for discussion than has been usual in the past.

Also, on this occasion at least, the attendance was well above the average in numbers, and was by no means dominated by elderly gentlemen of leisure.

Two papers were dealt with—one by Squadron Leader R. M. Hill, M.C., A.F.C., on "A Comparison of the Flying Qualities of Single and Twin Engine Machines," the other by Major Cecil Baker, D.F.C., A.F.C., on "Night Flying." The two papers were discussed concurrently. Squadron Leader Hill's paper was very largely a plea that pilots should fly with their brains, rather than with their senses, and that designers should give the pilots' brains a chance, particularly when they were designing multiple-engined machines. Whether that was the author's intention when he wrote the paper, one is not quite able to state—that, however, is the impression which it gives. If the impression sinks permanently into both pilots and designers, the paper will be of immense value.

Major Baker's paper on "Night Flying" was very largely a statement of the course of development of night flying during the war, of the uses to which it was put, of the difficulties encountered in navigation and observation, and of the types of machine suitable for night flying on war service.

On the subject of night flying for civilian purposes, Major Baker expresses a doubt—not as to its ultimate development—but as to its immediate prospects. He considers that the necessary cost of organisation will render it unprofitable till daylight air services are able to pay handsomely.

The discussion elicited from Air Vice Marshal Ellington that Squadron Leader Hill's paper had its origin in a report submitted by him to the Air Ministry on the same subject, and that its value to the aeronautical community generally had been recognised and publication through the R.Ae.S. advised by the Technical Dept.

Among the suggestions put forward for the diminution of the complexities of control of the multiple-engine machine by various speakers, the central geared engine room type of machine to avoid the swinging effect of the airscrew stopping, the development of single engine units of high power, continued research on control and stability and the development of variable pitch airscrews so that half engine power may afford some approach to half useful power, were touched upon.

It was upon the subject of night flying that the only marked difference of opinion occurred. Major Christie in particular was emphatic that commercial night flying must be developed—and forthwith—as the saving of a few hours by aerial transport over short distances would never pay for the costs of aerial services. Days must be saved over long journeys, and night flying was essential. Overseas night flying could be carried out safely with little organisation. Present navigation methods and existing marine lights were sufficient for many purposes. Forced landings at sea were simple, and could be made automatic in the dark. With a twin engine stable machine, which could keep the air on one engine, there need be no forced landings. Over land he was confident that the ground organisation could be arranged and that night flying was a certainty of the near future.

NOTICE TO GROUND ENGINEERS.

No. 13, 1920.—HANDLEY PAGE 0/400 TAIL PLANE FITTINGS.

It is hereby notified:—

1. Attention is drawn to the undermentioned tail plane fittings on the Handley Page 0/400 and cognate types, i.e., 0/7, 0/10, 0/11 and 0/14.
   (1) The rudder post attachment fittings (top and bottom) on rear tail plane spars.
   (2) The strut attachment fittings (top and bottom) on front tail plane spars.

Instances of the failure of these parts have been discovered which, if undetected, might result in failure of structure. The first signs of failure are small cracks which develop at the base of the lugs supporting the rudder post and interplane struts.

2. Owing to the weakness of these fittings owners of all British registered aircraft concerned have been notified that the Certificates of Airworthiness of the machines in question will be suspended unless the following action be taken:—
   (a) Close inspection of the fitting must be made *forthwith*, and if no signs of failure are observed, further inspection must be made after every succeeding period of *thirty hours'* flying. For the purpose of these inspections the fabric should be kept permanently removed from the rudder post fittings.
   (b) In cases where the part is found to have weakened it must be replaced *immediately*, and before any further flying takes place, by a new fitting, as shown on Drawing A.D. 2963.
   (c) In cases where no sign of weakness has yet shown itself the above replacement need not be made until the aircraft requires complete overhaul, provided that a strengthening clip, as shown on Handley Page Drawing 932, is fitted over the existing fitting *within a week* of the date of this Notice.

3. Ground engineers are reminded that they cannot issue a Daily Certificate of Fitness to Fly in the case of aircraft for which a Certificate of Airworthiness has been suspended.

Air Ministry, Oct. 23rd, 1920.

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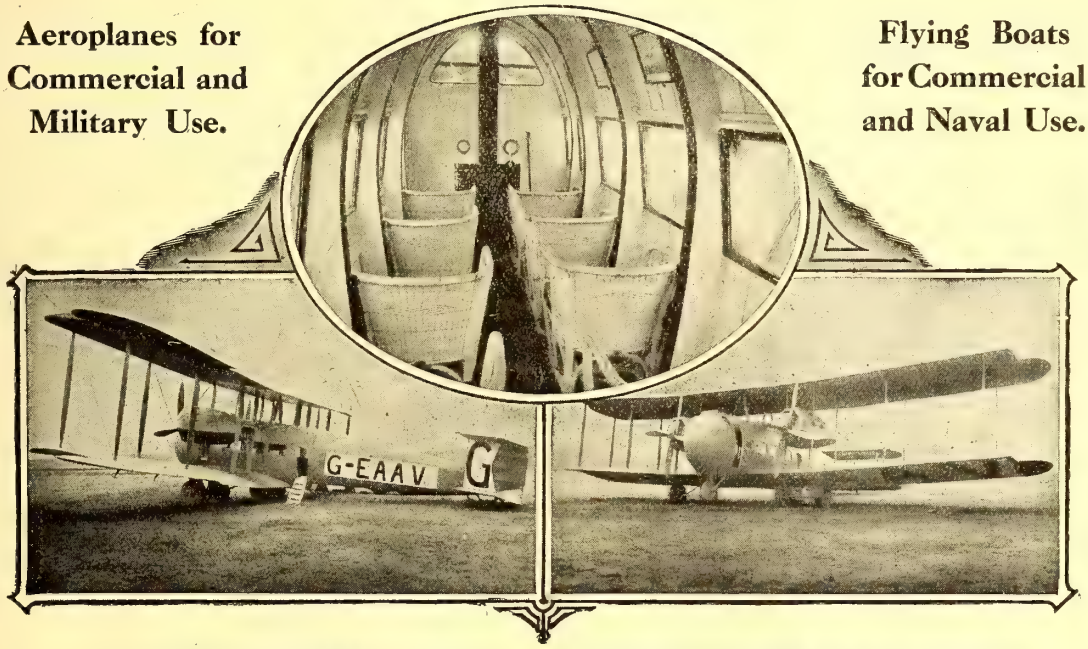

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GLASGOW—75, St. George's Place.
BRISTOL—55, Park Street.
NORWICH—16, White Lion Street.
BELFAST 26a, Arthur Street.

THE INSTITUTE OF AERONAUTICAL ENGINEERS.

Council Meeting.—A meeting of the Council was held on October 15th.

Elections.—Members: H. Sleeman, Esq.; Flight Lt. J. C. Atkinson, R.A.F. Associate Members: Major A. Dennison Pearce; Capt. A. S. Hemming, D.F.C.; Alfred B. Beer, Esq.; Donald Woods-Mason, Esq. Associates: J. R. Farrow, Esq.; J. D. V. Holmes, Esq.; Nicolas Florine, Esq.; Lawrence van der Byl, Esq.; H. B. Enderby, Esq.; H. L. Christie, Esq.; G. Haydon, Esq., M.Inst.Met.; A. Dennison Scarlett, Esq.

Life Membership.—The following scale for the computation of life subscriptions has been adopted:—

Age on application	Compound Subscription.
21—30 years	40 guineas.
30—40 years	32 guineas.
40—50 years	24 guineas.
Over 50 years	16 guineas.

Annual Subscription.—The annual subscription of Members admitted on or after October 1st in any year shall cover a period terminating on December 31st in the succeeding year. But under Rule 11 the subscription shall be paid by December 31st of the year of election. This by-law does not apply to elections prior to October 1st, 1920.

Annual Meeting.—An annual meeting of the Members will be convened for the last week in November for the purpose of electing five Members of Council, appointing an Auditor, and voting on a proposal for the institution of a Guarantee Fund.

Examinations.—The October examination is in progress. No examination questions set prior to October, 1921, will be published before that date.

Donations.—The Council desire to thank Messrs. Crosby, Lockwood and Son for the gift of a copy of Aerial Navigation, by J. E. Dumbleton, and H. B. Molesworth, Esq., for the gift of Patent Abstracts (Aeronautics) 1905-1915 (one volume, cloth gilt).

60, Chancery Lane, London, W.C.2. Douglas Shaw, Secretary.

THE PARACHUTE ARGUMENT.

In continuation of his last letter, Herr Max Unz writes:—

"Concerning the different systems of parachutes it has been proved that all the systems provided with mechanisms such as spring-bolts, spring-lids, compressed air, etc., serving to open the packing of the parachute and to release the parachute, have not succeeded, as the opening and release depend on many incidents.

"I first introduced a parachute which I named the 'Tube Parachute,' which was packed in a vertical tube placed in the body of the aeroplane. This tube was closed underneath in a simple manner. The flier was fixed to the parachute by a cable passing through a slit in the lid of the tube and reaching the aviator by the outside of the body of the aeroplane. With such aeroplanes fliers were saved by jumping overboard from falling aeroplanes on the Italian front. But there was a danger as the flier could only jump overboard from one side of the aeroplane on account of the cable.

"For that reason I introduced parachutes which were packed as a seat cushion or a back cushion permitting the pilot to jump overboard from both sides. A thin cord of 3-5 m. attached to the aeroplane and cushion opened the packing and released the parachute at the moment of jumping overboard. The moment the parachute was fully released the thin cord broke. A number of fliers with these systems were also saved.

"The disadvantage of this system was that in certain cases the function of the parachutes missed by being attached to the machine.

"For a long time I made experiments in order to find a system of parachute which operated the release and the opening without any connection with the aeroplane. After many dangerous experiments I succeeded in making one which was accepted by the official military officers and the fliers at the front as the best, and it was ordered to be used for the Austro-Hungarian fliers. But the situation on the front at that time (owing to the revolution) did not permit the control and registration of each parachute.

"I have given permission to some of the large manufactures of the following countries to construct parachutes on my system to my patents:—America (U.S.A.), Germany, Austria, Hungary, Czecho-Slovakia."

Also the following letter has been received:—

Sir,—I was interested to read the letter from Herr Max Unz, which appeared in your Aeronautical Engineering Supplement of the 13th ult., claiming that he had anticipated Colonel Holt's supposed invention of the pilot parachute for effecting the withdrawal and release of a main parachute from its container, which Colonel Holt calls the "Autochute" or Compound Parachute. On applying to the Patent Office I was informed that Colonel Holt's specification is not yet published.

Herr Max Unz states that he applied for his Austrian, Hungarian, Czecho-Slovakian, and German Patents for Pilot Parachutes on October 30th, 1918.

I think it will interest you and others to know that in my British Patent No. 16197 of 1915, applied for on November 17th, 1915, a Pilot Parachute is shown in Fig. 7, used for this identical purpose, but I do not include it in my claims because the device was not then *new*.

Later I showed a Pilot Parachute in my Specification No. 133734 of September 16th, 1918, in connection with a "resistance" parachute carried on the back of an aviator. Again I showed a pilot parachute in my Specification No. 135884 of September 21st, 1918, relating to soaring-type parachutes; and once again, in my Specification No 135245 of October 18th, 1918, in relation to a knapsack-type parachute for the combined purpose of pulling out the main parachute and subsequently of operating its positive opening. It will be noted that all these applications are prior to those of Herr Max Unz and Colonel Holt, and it is a little strange that they should appear to be unaware of any of them.

Palman qui meruit ferat. The honour of the invention of the pilot parachute belongs to the great French aviator Pégoud.

(Signed)
E. R. Calthrop, M.I.E.E., M.I.Mech.E.

TRADE NOTES.

The Reward of Enterprise.

Cellon, Ltd., of Cork Street, W.1, and Richmond, Surrey, have achieved remarkable success in the Air Ministry Competition. Out of the eight machines which won prizes five were doped with Cellon, namely, the Westland, the Sopwith and the Austin in the small machine class, and the Supermarine and Fairey in the amphibian class. Mr. Wallace Barr is distinctly to be congratulated on the success of his dope, particularly in the case of the Fairey, in which the tail unit actually bore the original fabric and dope put on when the machine was first built in 1917.

Furthermore, within the past six months Cellon, Ltd., have received orders for aeroplane dope from eight different Governments, most of the orders being for very considerable quantities. This hardly confirms the general idea, so sedulously fostered by the Press, that the Aircraft Industry is dead or dying.

Incidentally, people in the Aircraft Industry who are concerned with other industries really ought to investigate the merits of the "Cerric" dopes for wood and metal recently produced by the Cellon Company. These dopes, or perhaps one should rather call them enamels, produce the most wonderful effects in all colours, as well as in black and white and metallic pigments. No ordinary enamel that one has ever seen produces anything like such a finish, and the "Cerric" dope has the added virtue of being impervious to oil, petrol, turpentine and all the other solvents which fetch off ordinary paint. The black "Cerric" dope can only be compared to the finest Japanese lacquer. Mr. Wallace Barr will be very pleased to show specimens of his work to anybody who cares to call at Cork Street.

Aids to Success.

As with the Air Ministry aeroplane trials at Martlesham Heath when the Handley Page W.8 (450-h.p. Napier) won the Large Aeroplane Class, and the Westland limousine (450-h.p. Napier), the Sopwith Antelope (180-h.p. Wolseley "Viper"), and the Austin "Kestrel" (160-h.p. Beardmore) gained 1st, 2nd and 3rd prizes in the Small Aeroplane Class, so with the Amphibian Class, the Vickers "Viking III" (450-h.p. Napier) and the Fairey (450-h.p. Napier), which gained 1st and 3rd prizes respectively, B.T.H. magnetos were fitted. Palmer cord tyres were used on all the three amphibians with great success.

A Kent centrifugal windscreen was fitted to the Supermarine and drew forth much praise from the pilot, Capt. J. A. Hoare. Incidentally, the Supermarine Aviation Works, Ltd., have been carrying out extensive trials with this efficient windscreen with very satisfactory results. The efforts of a man in the front seat, armed with pails of water, to drown the pilot were entirely frustrated by this useful fitment.

Cellon Dope was used on the Supermarine and the Fairey, and British Cellulose Dope on the Vickers "Viking III."

METAL AIRSCREW CO., LTD., REGENT HOUSE, KINGSWAY, LONDON, W.C.2.; LEITNER-WATTS STEEL PROPELLER
RELIABLE AND DURABLE; FOR ALL AIRCRAFT, ALL ENGINES, ALL WEATHERS, ALL CLIMATIC CONDITIONS; BLADES DETACHABLE AND ADJUSTABLE; PACKS INTO SMALL SPACE.

B.T.H.—the Quality Magneto

at the Air Ministry trials at Martlesham Heath

Large Aeroplane Class.

First Prize - Not awarded.

Second Prize - Handley Page, Napier "Lion" Engine fitted with B.T.H. Magnetos.

Small Aeroplane Class.

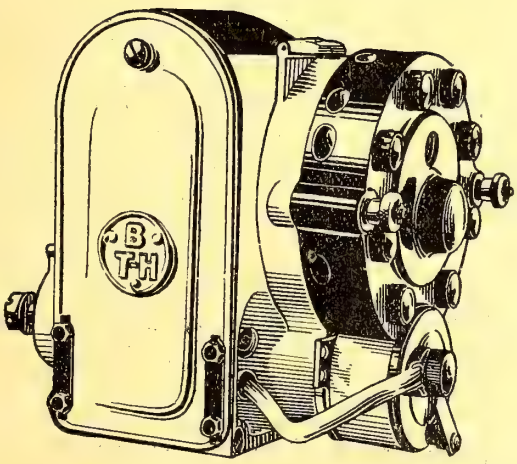
First Prize - Westland Six-Seater. Napier "Lion" Engine fitted with B.T.H. Magnetos.

Second Prize - Sopwith "Antelope." Wolseley Hispano "Viper" Engine fitted with B.T.H. Magnetos.

Amphibian Class.

First Prize - Vickers "Viking III." Napier "Lion" Engine fitted with B.T.H. Magnetos.

Third Prize - Fairey Amphibian. Napier "Lion" Engine fitted with B.T.H. Magnetos.



B.T.H. Magnetos are as perfect as engineering skill can make them.

B T-H

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Lower Ford Street - - Coventry.
Member of the British Ignition Apparatus Association.

POST-IMPRESSIONS OF THE AIR CONFERENCE.

BY AN EX-PILOT.

1. It is in the hope (probably vain) that it may interest readers of THE AEROPLANE to know how the proceedings of the Air Conference, or rather a part thereof (the writer was only there on the last morning), impressed an ex-officer, R.A.F., that I am emboldened to unload this screed upon the long-suffering public.

2. The general atmosphere of the Conference is not easy to render in a word picture, but that it was influenced very largely by the Spirit of the Guildhall itself, the spirit (not the spirits) of countless corporations, legions of Lord Mayors, is undeniable. This, no doubt, was partly responsible for the apparent solemnity of the discussion and an effort by our automobilist M.P. to infuse some "pep" into the proceedings—including, as it did, all the paraphernalia of strongly-worded resolutions dispatched hot from the oven, as it were (and half baked into the bargain) to H.M. Cabinet—was short-lived.

3. Of Sir Hugh Trenchard's paper there is little to be recorded. He dealt with a wide range of Service questions in a straightforward and businesslike manner, and he always manages to convey the impression that he has the situation well under control and that in spite of difficulties and obvious snags he has something in reserve. But as a matter of fact he was giving nothing away; the most significant things in his paper were the omissions—nothing about a Territorial scheme for instance. Doubtless matters conceived in the womb of time will be brought forth in their own due season, i.e., when it suits the Chief of the Air Staff.

4. His *leit-motif* was the means to be adopted to secure the necessary personnel for the R.A.F. and its reserves, which must be large. Of the more discussive matter a proposal which opened up attractive possibilities was that of carrying aeroplanes on mail steamers to drop passengers and mails at intermediate ports. This proposal was enlarged upon by the Director of Naval Construction later on, who gave us to understand that it was well on the way to becoming a *fait accompli*. These ships should prove popular with Test match teams proceeding to and from Australia and elsewhere. The C.A.S. touched upon the suitability of Air units for keeping in order turbulent outposts of Empire—he did not mention the coal-fields—in such parts where mischievous ones have no aircraft and are very amenable to the treatment.

The saving in expense resulting from extended use of this method should appeal to our great ones in authority, but doesn't seem to.

5. Admiral Sir E. A. M. Chatfield, who followed, was neither convincing nor inspiring. His vehement protestations of a desire to see greater use made of aircraft in the Navy were belied by a deep lack of faith in their reliability (as an example of which he took a 1914 incident in which not a small suspicion of blame rests with the Navy itself—in fact, not altogether a happy example) and by unreasonable demands in the way of performance on the part of the said aircraft, so that he could hardly be acquitted of a certain woolliness of thought. His idea of a suitable Naval aircraft appeared to be an apparatus possessing all the essential qualities of a battle-cruiser and able to fly as well.

6. Next came Sir Philip Chetwode, one of the finest living exponents of the Newmarket School of English Prose. He pointed out that, for those who have eyes to see, the great surprise of the war was neither tank nor Bertha, machine-gun nor Gotha, but the unexpected prominence of the Spade. This would never occur again if there was a ghost of a chance of making a flank. We wanted a "Quick-movin', Hard-hittin'" machine. [For the relief of apprehensive pilots, this does not appear to refer to new type of aeroplane designed to ram at high speed, but to the future composition of armies.]

7. Both this speaker and the last criticised the Chief of the Air Staff's scheme for seconding officers from the older Services, but the impression left was that General Chetwode and the Air Marshal were somewhat at cross-purposes, and that further discussion would speedily elicit a datum-line.

8. In his paper the Chief of the Air Staff had asked for patience, but admitted that impatience had its value in keeping us awake. Sir W. Joynson-Hicks supplied the impatience with a lavish hand. He criticised everything with generous impartiality and a lack of specialised information which must have been gratifying to the C.A.S. He wound up by demanding that a resolution be sent to H.M. Government urging the Importance of Egypt as the node of the Empire's Air Defences.

9. At this point an obscure individual of non-European parentage rose from the back benches and expressed gratitude on behalf of the self-determined Egyptians for reforms granted and gracious willingness on their part to grant us the necessary facilities.

10. On being asked by the chair whether this was meant as a motion of opposition to the resolution, he subsided as abruptly as he had arisen and was heard no more—*spurlos versenkt*. The Resolution was then declared passed without the formality of a division. The debate, which had looked like becoming lively, soon regained its dignified aspect. Although Sir W. Joynson-Hicks failed to add any matter of note to the discussion, his fluency was a delight to listen to and must fairly mesmerise his constituents on the hustings. But the real interest of his contribution lay in giving a side-light on the mental attitude of an educated Coalition M.P. towards Service questions—of which more anon.

11. His eye-glass firmly seated in place, the familiar figure of Major-Gen. Brancker rose to its feet. After hurling a piece of impertinence at the head of his superior officer the Air Marshal, he settled down and added perhaps the most useful contribution to the discussion yet heard, in an inimitably genial vein. While the arguments for some form of subsidy were eloquent and convincing, the most illuminating idea was brought forward that eventually the Navy and Army would run their own private Air Services—the R.A.F. developing into an altogether independent institution. An amusing anecdote of K. completed a really constructive speech, but its effect was possibly a trifle spoiled by the intangible air of the confessed propagandist.

12. Real food for thought was provided by Lieut.-Col. the Master of Sempill's demand for more attention to the needs of the technical and research branches in the way of personnel. Here was brought to light a matter for most urgent consideration and one which should be held firmly in the lime-light in view of the deplorable condition reached by these departments during the war.

13. This account would be incomplete without a reference to Sir David Beatty, who filled the chair with the requisite dignity and authority. Incidentally he was responsible for one of the best things of the meeting. In his peroration Sir W. Joynson-Hicks remarked that it blunders were made in war the final responsibility and blame rested on the "Statesmen," among whom, it is to be imagined, he numbered himself—but Sir David Beatty upheld the banner of the fighting men in debate by expressing his pleasure at hearing that the Statesmen would also take the consequent "punishment."

14. To be quite honest, few very distinct and lasting memories will be carried away from the Conference, and my general impressions are already becoming blurred. Perhaps the most fundamental phenomenon which emerged was the absolutely radical departure in the points of view of the politician and the Service men on Service matters. This, of course, is no new thing, but it was shown up in startling relief by the utterances of Sir W. Joynson-Hicks. Again, it was impossible not to draw comparisons between the attitudes of the Naval and Military minds to the question of air power. The latter, while exercising a powerful and intelligent criticism of the practice of the youngest Service, showed a sympathy with difficulties of the Air Staff and a practical willingness to use what it could get—in fact, a general spirit of helpfulness—which was lacking in the representative of the Senior Service. The Navy appeared to maintain an attitude of uncompromising aloofness and self-sufficiency, and while paying lip-service to the benefits of the aerial arm, gave the impression that in its heart of hearts it still believes that there is nothing like tar and oakum, and that "all it wants is a tall ship and a star to steer her by."

15. I may be biased, but it seemed to me that the biggest personality was that of the C.A.S., and it emerged triumphantly from the ordeal. To paraphrase a great leader of the past: *Venit—Visus est—Vicit.*

NOMENCLATURE EXTRAORDINAR .

The following letter is of immediate interest to the pioneers of aviation :—

Sir,—I desire to call attention to the misspelling of a number of the names of the pioneers of aeronautics carved on the base of the monument to Wilbur Wright, recently unveiled at Le Mans, France. Some of the more flagrant cases are given below, with the correct spelling in parentheses :—

Esnault Pelleterie (Esnault Pelterie).
Wilhem Kress (Wilhelm Kress).
Dupuis de Lome (Dupuy de Lôme).
Wehan-Stringfellow (Wenham and Stringfellow).
Lieut. Gelfridge (Lieut. Selfridge).
Cecile Grace (Cecil Grace).

In many instances the names that happen to be correctly spelled are incomplete, i.e., only the final names are given.

It would be interesting to learn what jury passed upon the names inscribed on this monument, and how such blunders, which may well cause confusion in years to come, were made. It is stated on the base that the monument was presented by a Mr. Beaumont and a number of citizens of Dayton, Ohio, U.S.A. (Signed) JOHN JAY IDE.

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THE KEYNOTE

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SOME BELATED BOOK REVIEWS.

"CONTACT" AGAIN.

EASTERN NIGHTS AND FLIGHTS. By Alan Bott ("Contact"). (Blackwood and Co. 8s. 6d. net.)

The good "Contact," the first man who ever wrote a worthwhile book about the Flying Services, has again given us something well worth reading. The success of the aforesaid first book, "An Airman's Outings," was so great, and did so much to show the R.F.C. in its true colours as the fine service it was, that Captain Bott, as he had then become, was told off by the High Authorities to go and fly on all the different fronts, to kill Huns if he could, to avoid being killed if he could, and, if he succeeded in the second condition, to write home and tell the British Public all about it, or at any rate, as much about it as seemed good to the Censor, then in the plenitude of his power.

Unfortunately, Captain Bott, having done a little flying in Italy, and having moved on to Palestine, was shot down shortly after arriving in that Promised Land in which our Hebrew compatriots seem so anxious not to reside. When he was appointed to do this fighting Cook's Tour of all the fronts Alan Bott paid one the compliment of saying that the lengthy and elaborate review of "An Airman's Outings" which appeared in this paper had a good deal to do with attracting the attention of the High Authorities to his book and so was largely responsible for his being sent out East. One fears, therefore, that one is partly responsible for the peculiarly uncomfortable time which he spent as a prisoner with the Turks. On the other hand, one is equally entitled, on the same lines, to claim some of the credit for this excellent new book.

The volume is in fact a reprint of a series of articles which appeared last year in Blackwood's Magazine—far and away the best magazine for war stories during and since the war—but it was not everybody who could afford 2s. 6d. a month for the great "Maga," and, even of those who could, many will be glad to have these yarns in book form, to re-read and to keep as companions to the yarns of McCudden, Maurice Baring, and "Contact's" own earlier effort.

The flying part of the book only occupies a fraction at the beginning, but it is quite up to the form of the famous "Outings." The rest has little enough to do with flying, but at the same time Alan Bott never forgets that he was once an aviator. For example, his story of how he managed to "do a bit of no good" to a batch of German aeroplanes which were about to pass through the famous Taurus Tunnel is as good a yarn as anything in the book.

One of the daily papers, being run by journalists and meaning quite well, insults Captain Bott by calling him a "first class reporter." Considering that the best of reporters—judging by the least bad descriptive efforts in the daily Press—is at best a lineal descendent of the original Gadarene swine, one sympathises with Captain Bott under the intended compliment. As a matter of fact "Contact" is in the direct apostolic succession from the great diarists of past centuries. In these squeamish days "Contact" has to Bowdlerise himself as heavily as Mr. Samuel Pepys has to be Bowdlerised by his modern publishers. But peeping out here and there one can see gleams of how amazingly Elizabethan, or Carolean, "Contact" could be if he let himself go. And in spite of modern limitations he can tell a yarn as few men can when the limitations are removed.

As one might expect, "Contact" is scrupulously fair to the enemy. He is too good a soldier to abuse the Turk or the German or the Austrian in the hope of helping to sell his book. He makes it quite clear that he only met one really unpleasant German during his imprisonment; he says frankly that when he had trouble with the Turks he always tried to find an Austrian, knowing that he would then get fair play; and he writes down the Turk as an ignorant brute without intelligence and without much deliberate malice; he shows the Arab and the Armenian and the Greek as the contemptible and vicious worms they are—though he does not go so far as a recent writer who remarked that the Turkish Government was the most benevolent in the world, for if it had been otherwise it would have massacred all the Armenians and Arabs and Greeks. Also, when, after many adventures, he escapes to Odessa, he describes the Russians just as they are, conveying the impression of a mass of futile and corrupt idiots with the active brains and lack of set purpose of a mob of monkeys, terrifying because of their mere mass.

Of his personal adventures one has no room to write. His several attempts to escape, his journey from Damascus to Constantinople, his horrible period of hiding in the foetid ballast-tanks of a Bolshevik tramp steamer, his disguises in Odessa as a German-speaking Lett, and other queer things, and his final escape from Russia to civilisation are too good to miss. One advises all one's readers to buy the book and in reading it to remember that Alan Bott, gallant soldier and born spinner of yarns, is of the stuff which made the old R.F.C. and of which the new R.A.F. is made.—C. G. G.

THE SEAMY SIDE OF THE R.A.F.

THE ROUGH ROAD TO THE STARS. By Anna Floyd. (T. Werner Laurie, Ltd. 247 pp 5s. net.)

"The Rough Road to the Stars"—bearing as a secondary title the old R.F.C. motto, "Per Ardua ad Astra," strikes one as being an entirely unnecessary book. It hardly points a moral and it is a tale which would need a deal of adorning to make it palatable. The story of the woman of the streets who remains theoretically pure in spite of her defilement, and is ultimately redeemed by love, has been vastly better told by the late George Gissing in "The Unclassed." Miss, Mrs. or Mr. Floyd's story is painfully crude alongside Gissing's supreme art, and belongs to that modern school of so-called "realism" in which matter appears to be so much more important than manner. Nevertheless, in its crude way there is a certain interest in the book, not in the story, which is of the cheapest *feuilleton* type—barring that a respectable family newspaper would be afraid to publish it—but in the unholy knowledge the authoress (or perchance the author) displays of things which are better left unsaid.

Setting aside the sensations, experiences and adventures of the W.R.A.F. driver who is forced onto the streets by her congenital incompetence, the nastiest side of the Home Service R.A.F. in general, and of the London Air Defence section of it in particular, is served up in the raw, accompanied by a wealth of detail which shows that the authoress (or author) knew a good deal more of the inside of that unfortunate service than most people. The scene between the Chiefs of Departments in the Hotel Bolo displays a knowledge of that misbegotten establishment which suggests a prolonged sojourn therein.

The technical errors concerning the R.A.F. are slight, as for example calling a Bristol Fighter a Bristol Scout, while the remaining details are as accurate as photographs. Incidentally, so far as one can remember, there was only one Bristol Fighter squadron in the L.A.D.A., so the members of that squadron would seem to have a justifiable grievance against Miss, Mrs. or Mr. Floyd for saddling them with the unsavoury method of life depicted in the book. Perhaps some R.A.F. people did live in the way narrated, but one doubts whether a number of officers of any L.A.D.A. squadron consorted openly in the local hotel with women of obviously bad character under the eye of their adjutant, as described in the scene in a hotel at Epping.

It is possible that the book may have a certain historical value, just because it depicts the nasty side of the R.A.F. so nearly accurately. For some day, when the R.A.F. has become what it will be, it may be healthy to turn to these unsavoury pages and remind oneself of what it escaped being.

One remains doubtful as to the sex of the writer of the book, for no woman ought to know so much of the dirtier side of life as described with photographic lack of art in the pages under review. On the other hand one doubts whether a man would be such an ass as to give the game away as is done therein.—C. G. G.

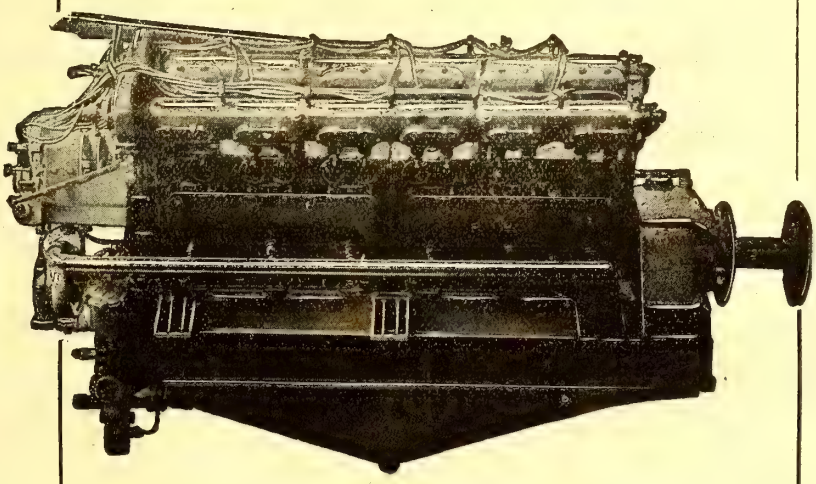
SOME AMUSING ERRORS.

AVIATION AND INSURANCE. By Hugh Lewis (Royal Aero Club Pilot Certificate) (London Manager, Liverpool and London and Globe Insurance Co., Ltd.) and Captain Gwilym Hugh Lewis, D.F.C. (late R.A.F.) (of the Thames and Mersey Marine Insurance Co., Ltd., London). 60 pp. (Stone and Cox.)

The Lewises, *père et fils*, are both aviators and both insurance men. It is to be hoped that they know more about insurance than they do about aviation, if one may judge by their statements on the former subject. They plead that the book was "put together hastily," but that is no excuse for such statements as: "Triplanes . . . are, broadly speaking, the most efficient of land planes": Monoplanes did not figure prominently in the War, being found difficult to handle, lacking in stability and strength, restricted as to vision, and slow in manœuvring (shades of the Fokker scourge and the Bristol mono): "Ordinary seaplanes with landing floats": "It has been estimated" (By whom? one may ask.) "that the life of a war machine put to commercial purposes is, at the most, about 600 hours": "The Mono is considered a first-rate engine for instructional purposes. There is also the Gnome, which at one time was much used": "In a very cold country like Russia, however, the Rotary engine would probably prove most useful": "Most of the engines designed by the Royal Aircraft Factory are probably scrapped by now" (There being, at a moderate estimate, somewhere over 5,000 of them in existence): "First-class stationary engines should be completely overhauled every 100 hours": "For an aeroplane to be thoroughly *efficient* there must be a large margin of power in the engine."

There is much more of a similar nature, either absolute mis-statement of fact or sloppily-worded sentences which are liable to give an entirely erroneous impression. Really experienced business men, such as the authors may be assumed to be, ought to know better.—C. G. G.

SUNBEAM-COATALEN ENGINES



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(*Continued from page 756.*)

The London Terminal Aerodrome.

The Air Post of Banks, Ltd. (in formation), suspended operations last week pending reorganisation. They were due to start again on Monday and will probably shortly adopt a new title. The excellent and businesslike way in which they have carried on their daily service in each direction has been commented upon by all. Particulars of their month's work will be noticed in an advertisement displayed elsewhere in this paper.

The foggy weather has had the effect of preventing many machines from actually reaching the aerodrome. On Saturday the "Goliath" landed at Hounslow and the Bréguet and Nieuport in places east and west of London. The wooden Fokker was expected, but landed at Lympne owing to bad weather, the three passengers and Mr. Hinchcliffe proceeding to London by rail. One learns that the machine returned to Amsterdam on Monday without coming on to Croydon.

Sunday was the best day of flying that was not actually arranged (as was the Air Conference day) that one has yet seen at Croydon. Machines were in the air all day. The "Kangaroo" was "incessantly expected," but apparently did not like the foggy weather, which caused the officials of the I.A.L. to doubt its suitability as a machine for regular air-line work.

It seems a great pity that there are not more machines of the "London" type. This is a commercial triplane built by the Nieuport and General Aircraft Co., the moving spirit of which is Sir Samuel Waring, Bart., who obtained his baronetcy for his services to aviation. Sir Samuel is the moving spirit of three aeroplane companies—B.A.T., Nieuport, and Alliance. One learns that all of these companies have for the moment suspended actual aircraft construction and practical flying, though they all produced various commercial types of aircraft which would now be of vital use to civil aviation.

The first machine to appear on Sunday was the "18," flown up from Lympne by Mr. Armstrong. Thence onwards machines were appearing all day to the accompaniment of a really excellent pyrotechnic display by the C.A.T.O. staff and that of the I.A.L. The new signal bomb is a great improvement on the rocket and far more fun.

Mr. Lovell, the pilot of the D.H.5, which is used for experimental work by the Marconi Wireless Telegraph Co., has just been rebuilding and repainting his machine. Among other improvements, he has now got a D.H.9 rudder and separate cockpits for pilot and operator. The machine now has a very pleasing appearance.—G. D.

A.T. and T. Notes.

A jazz band of sorts travelled to Paris in an "18" during the week. It is said that they performed their dastardly work *en route*. Mr. Duke was testing a "9" on Thursday. Owing to engine trouble he discontinued his flight.

Machines have been forced to land at Lympne, Penshurst, and Biggin Hill owing to the fog, but in spite of this the Paris journey has been greatly shortened because the train and boat service has been delayed even more.

Most of the machines which had been delayed came in on Sunday morning.—G. D.

The Instone Air Line.

The Bat, besides going to Paris during the week, went to Carmarthen with two *Evening News* photographers to bring back the first photographs of Mr. Greenwood for the late editions of that paper. The machine was fitted up internally as a photographic dark-room. Mr. Barnard landed in a small field near the town and when the photographs were obtained he got off successfully again and flew back to Croydon, during which time the photographs were developed and printed. This is a novel way of using aircraft, besides being a real, sound commercial undertaking. It seems probable that an aeroplane or aeroplanes will soon be attached to the regular staffs of the more enterprising dailies.

The machine was to go to Boulogne on Wednesday for photographs of the boat bearing the body of the Unknown Warrior.

Mr. Chattaway with the Bat was the only pilot to make Croydon in the fog of Saturday.

A Blackburn "Kangaroo" was expected on "appro." for the I.A.L. She arrived at Hendon on Saturday, but did not proceed owing to fog. She was expected all day on Sunday, but though other machines were flying at Croydon all day, and machines that had overshot Croydon in the previous day's fog and landed to the north and west of London were able to make Croydon, and in the far worse conditions of the late afternoon Handley Page G-EATG got through to Cricklewood, having passed over Croydon, Mr. Kenworthy, the Blackburn pilot, considered the weather in the neighbourhood of the Waldorf Hotel too bad to bring the machine from Hendon. Mr. Samuel Instone, a director of the I.A.L., was waiting at Croydon to see the machine. This hardly seems the best way to sell aeroplanes.

In the afternoon the "Vimy" was giving popular flights at 5s. per passenger and 10s. for the seat by the pilot for a circuit over Waddon, Purley, Wallington and Beddington. About 100 passengers availed themselves of this opportunity for cheap flights, one enthusiast having about five trips. It was rather reminiscent, as Mr. Instone himself said, of the *Skylark*, that shilling emetic of all seaside health resorts, except that it caused none to "emet." One believes that these cheap flights are in future to be a regular feature of the Croydon Aerodrome on Saturdays and Sundays, and one hopes that the Air Ministry will see fit to waive its right to the 10s. landing fee (which a machine of the "Vimy" type is now charged) when it is engaged on this excellent propaganda work. It is really too ridiculous that, if the machine makes ten flights, it should have to pay away £5 to the Department of Civil Aviation.—G. D.

Politeness Pays.

Air Ministry Notice to Airmen No. 114 of the year 1920 deals with prices of Aviation Spirit to "Civil Pilots." One would imagine that if a pilot *was* civil to the barmaid he would quite naturally get his spirit cheaper than if he was rude.—G. D.

The Manchester Aviation Co.

During the last month or two the Manchester Aviation Co. have been doing a considerable amount of work in the Manchester district. From Macclesfield a move was made to Hazel Grove, near Stockport, where during the month 400 passengers were taken up. The only incident occurring there worthy of mention was that, on one occasion, a wheel was dropped when taking off. The pilot, Mr. E. L. Wilson, who had noticed the fact, made a very nice landing on the remaining wheel without straining a wire. From Hazel Grove they moved to Bramhall for a fortnight and carried about 300 passengers, one enthusiast going up 11 times. At present they are at Alderley Edge, but it was expected that they would have to stop flying for a time owing to the coal strike.

It is their intention to fly right through the winter and have arranged to visit the following towns: Manchester, Bolton, Ashton, Oldham, Rochdale, Wigan, Burnley, Sale—in fact it is intended to visit most of the towns within a radius of 40 miles of Manchester.

Woking.

Martinsyde, Ltd., reopened their works on Nov. 8th, and a number—but not the whole—of the employees were re-engaged to work short time. It is expected that all the employees will be working full time by the end of November. At present the activities of the firm are confined to work on their motor-cycle and they hope to exhibit six machines at Olympia.

It is said that there are a few aircraft draughtsmen still employed by the firm, but that these are being taken off aircraft work, which is at a standstill. Certainly one has not seen a Martinsyde machine in the air for some considerable time.—J. F. S.

The Martinsyde Episode.

Mr. Daniel S. Fripp, of Evans, Fripp, Deed and Co., has been appointed receiver and manager of Martinsyde, Ltd., by the London County, Westminster and Parr's Bank, Ltd. His appointment was confirmed by the Court on Nov. 2nd, 1920.

Though of course the appointment of a receiver is to be regretted, it appears to have been in fact the only way in which justice could be done to those who have in the past done business with Martinsyde, Ltd. Failing this course, the Treasury would have seized the whole place in order to realise excess profit duty, with the result that the bank, who hold debentures on the works, and all the firm's creditors, would have received nothing, owing to the fact that under a forced sale it would have been difficult to realise even the amount needed for excess profit duty.

Under the present arrangement the receiver will carry on the business as hitherto under the same management, and the state of the Martinsyde business, in spite of general trade depression, gives every indication that all debts will be satisfied in due course, provided always that the creditors co-operate with the receiver and the firm.

This is an excellent example of the way in which panic legislation, while on the face of it showing that the country is able to pay its debts, does in fact strike at the root of the production of national wealth.

One wishes every success to the Martinsyde scheme and hopes that after another season or so the whole of the excellently arranged works will again be busy on aircraft production.

A Scottish Enterprise in Civil Aviation.

The following interesting circular letter has been issued by the Air Navigation Co. (Scotland), Ltd., of 219, St. Vincent Street, Glasgow:—

> "Gentlemen,—We beg to bring to your notice the services which we are able to render you in connection with Aeronautics and allied industries.

"With a competent staff of engineers and draughtsmen, we are prepared to undertake all estimating, advising, surveying and laying out of proposed routes, aerodromes, etc., and to design machines and engines for any particular service to our clients' requirements, and manufacture to specification.

"Inspection of machines and plant during construction and the lay-out of aerodromes is also within our scope, whilst the preparation of patent and invention drawings is also a special feature.

"In short, where advice or assistance, either technical or financial, is required in connection with Aeronautics, we are prepared to place at your service expert assistance, and the most complete and up-to-date knowledge of the subject available.

"Assuring you at all times of our very best endeavours on your behalf, We beg to be, Your obedient Servants,

"For the Air Navigation Co. (Scotland), Ltd.,

"(Signed) CLAUDIUS P. JENKYNS, *General Manager.*"

Mr. Jenkyns is to be congratulated on his enterprise on starting what must be the first regular aeronautical engineering undertaking in Scotland. Undoubtedly there will come a time when Civil Aviation develops to such an extent that aero-garages and the assistance of consulting aeronautical engineers will be required by owners and operators of civil aircraft. History teaches us that those who first started motor engineering works are the people who have done best in the end and one can only hope that Civil Aviation in Scotland will develop so rapidly that ere long the Air Navigation Co. will find itself fully employed on aircraft work.

FOREIGN INTELLIGENCE.

FRANCE.

A New Speed Record.

On Nov. 3rd, Capt. the Count de Romanet, flying a Spad-biplane (300 h.p. Hispano-Suiza), beat the world's speed record, made by M. Sadi Lecointe on Oct. 20th, by covering the measured kilometre at Villacoublay twice (once each way) in an average time of 11.65 sec. per kilometre, which works out to a speed of 309.12 kilometres (193 miles) per hour. In one direction he flew at the rate of 321 kilometres, or nearly 201 miles, per hour.

GERMANY.

Aerodromes for Civil Use.

It is stated on the authority of Handley Page, Ltd., of Cricklewood, that the Inter-Allied Aviation Commission have decided to waive the destruction of the following military aerodromes :—

Breslau, Gandau, Brunswick, Fürth, Grossenhain, Hamburg, Paderborn, Schleissheim, and Deveen, near Königsberg.

The following seaplane stations, Kiel, Holtenau, Nordeney, Warnemünde, Lift, and the airship stations Nordholz, Seddin, and Friedrichshafen, are included in this list.

Fifteen per cent. of the privately owned aeroplane sheds on these aerodromes will be left standing, but the airship sheds in nearly every case will be destroyed. The terms of the Treaty of Versailles will not be put into effect with regard to these aerodromes, as it is in the interests of international civil aerial transport that they should be preserved.

RUSSIA.

An Amusing Rumour.

The following was circulated by the Bolshevik wireless press on Nov. 4th :—

> The engineer Makhonin (the inventor of the electric train) has elaborated a project for the construction of a new giant airship. His scheme has been examined and approved by a special committee of experts.
>
> The motors of the airship will be of 24,000 h.p., and its freight-carrying capacity 60,000 poods (about 967 tons). It will have several berth decks, and a lift will communicate with each of them. A motor car, an aeroplane, and a motor boat will be carried.
>
> This new airship will be capable of carrying 1,000 persons, and her speed will be 100 versts (about 66 miles) an hour.
>
> This first Soviet airship is a great victory in the field of technical science. It is expected that its construction will be completed by May 1st, 1921.

One salutes the *Daily News* for heading this effusion "The Mayflyski," it is the *mot juste*. The same paper recalls that the first giant aeroplane, the Sikorski, was produced in Russia. It will be remembered that it had only its size to recommend it. Personally, one imagines the "Mayflyski" to be first cousin to Russia's "bursting corn-bins," as advertised by Mr. Lloyd George.

Or can it be that Engineer Makhonin is only the Russian way of spelling Marconi, and that the whole ship will be as real as a Marconi telegraph cable, and as profitable as was Mr. Lloyd George's gamble in Marconi shares some few years ago?—C. G. G.

JAPAN.

A Japanese correspondent writes :—

The Death of Two British Aviators.

Mr. Herbert Frank Shaw Kilby (an aviator of Sale and Frazar Co.), agent of Handley Page, Ltd., piloting Norman Thompson flying-boat, motored Viper 240 h.p., and his mechanician, Mr. Arthur Sunman, plunged straight down to the ground in the land between Susaki Aerodrome and Tokio Bay on the afternoon of Aug. 2nd. Mr. Kilby was killed instantly and Mr. Sunman died in the ambulance on the way to St. Luke's Hospital.

The machine was less than 300 feet from the ground and sailing perfectly before the accident occurred. While rounding into a second turn, Mr. Sunman had waved his hand for his friends below. A moment later the machine apparently side-slipped and came down in a nose dive and next crashed to the ground.

The falling machine crashed into a bridge near the aerodrome and seriously injured one spectator, and two men and a small boy were injured.

The machine is the same one that was used by Mr. Kilby on July 4th to make a trial flight from Tokio to Yokohama and back in honour of America's Independence Day. It had made several flights since that time, the last one taking place last Friday, and all have been successful.

Mr. Kilby was a lieutenant in the British Aviation Corps during the great war, in which capacity he saw much active service. Mr Sunman was a sergeant and also saw service in the war. Mr. Kilby was 23 years old and had been living with his sister, Mrs. Owston, near Yokohama. He was unmarried and his home was in England. Mr. Sunman was 32 years old and is survived by a widow who lives in England.

N. K.

UNITED STATES OF AMERICA.

The San Francisco Mail.

A daily trans-Continental air mail service has recently been inaugurated between New York and San Francisco. On Wednesday, Sept. 8th, the first machine, a D.H.4, piloted by Mr. Randolph Page, left the Curtiss Aviation field at Mineola, Long Island, for Cleveland, Ohio. The machine carried 16,000 letters, weighing 400 lb. Mail bags will be dropped by parachute at set places *en route*. It is hoped that by this means the ordinary time of 91 hours by ground methods will be reduced to 54 hours.

The Air League of America.

The Air League of America is advocating the formation of units of the League throughout the States by local authorities and enthusiasts. Elaborate agreement forms have been issued which contain spaces for the signatures of office-holders and thirty-seven sub-committees. The sub-committees thus formed will deal with naval and military matters, aerial mails, air routes, aerial law, insurance, maps, medical instruments, meteorology, public exhibitions and, indeed, everything that is connected, even remotely, with the science of aviation.

[This precious Air League is one of the attempts of the notorious Mr. Casalegno (alias Woodhouse) to foist himself, Alan R. Hawley and Augustus Post on American Aviation, and any connection with it is to be carefully avoided.—Ed.]

A New Key West-Havana Service.

By the amalgamation of the Aeromarine Engineering and Sales Co. with the Florida-West Indies Airways, Inc., an organisation known as the Aeromarine-West Indies Airways, Inc., will operate a fleet of flying-boats on the Key West-Havana Service, carrying passengers and mails. A contract signed with the Post Office Department entails a daily service each way. The flying-boats to be used will be converted F.5-Ls (2-400 h.p. Liberty), having cabin accommodation for eleven passengers. The operating staff will be under the management of G. H. Bonnell (late Major, R.A.F.). It is intended that the six boats will be launched at Keyport, N.J., before November, and flown to Key West, where the hangars and repair shops have already been completed, while those at Havana are nearing completion.

The First Newspaper Aeroplane.

What appears to be the first attempt to use aircraft for the collection of news, etc., by newspapers has been accomplished by the *Evening Sun*, of Baltimore. The Editorial Department of this news-sheet has acquired a Canadian Curtiss biplane and the services of W. D. Tipton (late Flight-Commander, U.S.A.S.), and work was commenced with it on Sept. 1st.

By covering important happenings by means of this agency it will be possible to report in the afternoon or evening editions, occurrences which, in the past, have been impossible to report owing to the time required to reach the spot and return; so that the *Evening Sun* should be able to effect many "scoops" that, in time, it is hoped, will pay for its ambitious experiment.

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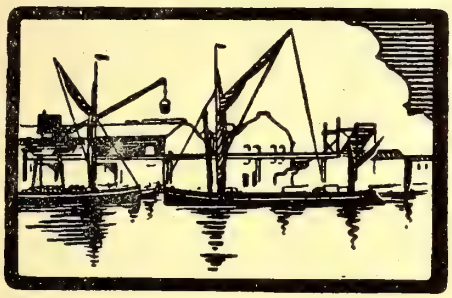

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AIRCRAFT IN PARLIAMENT

On Nov. 4th the Air Navigation Bill (Lords) was considered by Standing Committee A of the House of Commons, under the presidency of Sir William Pearce, and was reported with Amendments. The Bill to lie on the Table and be printed (No. 205); Minutes of the Proceedings to be printed (No. 205). The Bill, as amended, was taken into consideration Monday, Nov. 8th, and is to be printed (Bill 225).

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

The next meeting will commence at 5 p.m. instead of the usual 5.30 p.m., at the Royal Society of Arts, on Thursday afternoon, Nov. 18th—the day following the annual dinner. Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., Director-General of Supply and Research, will take the chair. The paper will be "The Problem of the Helicopter," by M Louis Damblanc

ANNUAL DINNER.

A considerable number of tickets for the annual dinner have already been sold, and early application for the remaining places is therefore desirable. Tickets will be forwarded to those members who have already applied as soon as these are received from the printers. Members will assist the Secretary in arranging the seating accommodation if they will notify him of any arrangements for forming parties. The price of the dinner has been fixed at one guinea per head, exclusive of wines.

EXAMINATIONS COMMITTEE.

The first meeting of the new Examinations Committee will be held at the Society's Offices at 5.30 p.m. on Thursday, Nov. 11th. The following members constitute the Committee: Dr L. Bairstow (chairman), Wing Commander T. R. Cave-Browne-Cave, Prof. B. Melvill Jones, Dr. R. Mullineux Walmsley.

LIBRARY.

The Council desire gratefully to acknowledge the gift of a bound copy of the Report of the Steel Research Committee, which has been placed in the Library. It is desired to inform members that copies of this Report may be obtained from the Steel Research Committee, 28, Victoria Street, price 31s. 6d. (less 33 1/3 per cent. if applied for before Nov. 27th).

The following book has also been placed in the Library: "A Treatise on Airscrews," by W. E. Park.

W. LOCKWOOD MARSH,
Secretary.

Nov. 5th, 1920.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Oct. 1st.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The following officers resign their perm. commns., and are permitted to retain the rank of Flight Lt.:—Flying Officer M. H. Findlay, D.S.C., D.F.C., Flying Officer F. R. Hockney, Oct. 1st.

SHORT SERVICE COMMISSIONS.—The following officers are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their seny. in the substantive rank last held by them prior to the grant of this commn, except where otherwise stated:—

Flight Lts.—D. L. Blackford, Sept. 13th; A. W. Clemson, D.S.C., Aug. 18th; H. J. Roach, A.F.C., Sept. 22nd.

Flying Officer (from Flight Lt.)—G. H. D. Gossip, Sept. 14th.

Flying Officers—A. N. Appleford, Sept. 20th; W. R. K. Atkinson, Sept. 21st; H. W. Baggs, Sept. 14th; F. H. Barton, Sept. 28th; C. H. Bird, Sept. 15th; F. E. Bond, Sept. 27th; K. L. Boswell, Sept. 14th; C. F. Briggs, Sept. 20th; J. C. Burney-Cumming, Sept. 25th; C. G. Gilbert, Sept. 16th; H. A. Hamersley, M.C., Sept. 20th; E. Jackson, Sept. 28th; W. T. Lewis, Sept. 17th; V. S. Parker, Sept. 28th; F. L. Pearce, Sept. 15th; W. B. E. Powell, Sept. 13th; A. J. Rankin, Sept. 27th; H. B. Richardson, M.C., Sept. 23rd, I. C. G. Simpson, Sept. 28th; C. R. Smythe, Sept. 16th; C. D. Spiers, Sept. 13th; L. G. Spinney, Sept. 13th; W. E. Swann, Sept. 25th.

Flying Officers (from Pilot Officers), with seny. of the dates indicated.—C. W. S. Chalmers, Sept. 20th; H. Macmillan, Sept. 27th; A. C. Meredith, Sept. 22nd; S. A. C. Newnham, Sept. 20th; R. H. Rose, Sept. 20th

NOTE.—Flying Officer Gossip will be placed at the head of the list of Flying and Observer Officers, and will retain seny. relative to officers who have been similarly gazetted to short service commns. in a rank lower than their previous substantive rank in accordance with his previous position on the gradation list.

Flying Officer J. E. C. Hammond resigns his short service commn., and is permitted to retain his rank, June 20th.

Observer Officer G. L. Nicholson resigns his short service commn., and is permitted to retain his rank, Oct. 1st.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

ENGAGEMENTS.

BENN—HOLMES.—The engagement is announced of Capt. Wedgwood Benn, D.S.O., D.F.C., M.P., late R.A.F., and Miss Margaret Holmes, daughter of Mr. D. T. Holmes, formerly M.P. for Govan, and a granddaughter of Provost Eadie, of Paisley.

BENTLEY-DACRE—FRASER.—An engagement is announced between Sqdn. Ldr. George Bentley-Dacre, D.S.O., R.A.F., son of Dr. John Dacre, Eaton Crescent, Clifton, Bristol, and Elizabeth Frances, daughter of Mr. and Mrs W. P. Fraser, Johannesburg, South Africa, and niece of Mrs. Capper Pass, Charmouth, Dorset

DE BURGH—SHARP.—The engagement is announced of Flying Officer Desmond de Burgh, A.F.C., R.A.F., late R.F.A., only son of Colonel Ulick de Burgh, C.B., of 48, Draycott Place, S.W., to Norah, younger daughter of the late Captain Richard Sharp and Mrs. Sharp, of Sissinghurst Grange, Cranbrook, Kent

CROKE—CHURCHER.—An engagement is announced between Flight Lieut. L. G. Le Blount Croke, R.A.F., Fort Grange, Gosport, and Phyllis Mary (Fay), elder daughter of Major and Mrs. George Churcher, Woodcote, Alverstoke, Hants.

ELLWOOD—MATTHEWS.—The marriage arranged between Flying Officer Aubrey Beauclerk Ellwood, D.S.C., R.A.F., youngest son of the Rev. C. E. and Mrs. Ellwood, of Cottesmore Rectory, Oakham, and Miss Lesley Mary Joan Matthews, elder daughter of Mr. and Mrs W. P. Matthews, of the Old House, Walmer, will take place in India early in December.

LANGRISHE—CARTLAND.—A marriage has been arranged between Terence Hume Langrishe, late Irish Guards and R.A.F., the only surviving son of Sir Hercules Langrishe, Bart., D.L., late Comdr., R.N.V.R., of Knocktopher Abbey, Co. Kilkenny, and Barbara Hamilton, only daughter of the late Major Bertram Cartland, Worcestershire Regiment, and of Mrs. Cartland, 68, Eaton Terrace, S.W.

COMING EVENTS.

NOVEMBER.

12th, Fri.—Engine Repair Shops (France). Reunion at Holborn Restaurant. Secretary, Fl. Offi. D. Drover, Room A.243, Air Ministry. Western Aircraft Depot, R.A.F., Yate, Glos., dinner at 7.30 p.m., at Anderton's Hotel, Fleet Street. Particulars from Mr R. K. Law Markham, Cromwell House, 33a, High Holborn, W.C.1.

13th, Sat.—Second Annual Reunion Dinner of Redcarites at Imperial Hotel, Russell Square. Particulars from Mr. W. E. Crozier, c/o Bank of Adelaide, 11, Leadenhall Street, E.C.3.

17th, Wed.—R.Ae.S. Annual Dinner at 7.30 p.m., at the Connaught Rooms. Tickets (price 21s. exclusive of wines) from Sec.

18th, Thurs.—R.Ae.S. lecture. "The Problem of the Helicopter," by M. Louis Damblanc.*

20th, Sat.—No. 8 Naval Sqd. Dinner at Holborn Restaurant at 18.45. Particulars from Sqd. Ldr. Bromet, H2, Coastal Area, 33, Tavistock Place, W.C.1.

DECEMBER.

1st, Wed.—Westgate-on-Sea Seaplane Base and R.A.F. Manston Dinner at Holborn Restaurant. Particulars from Mr. T. S. Setterfield, 1, Cuthbert Road, Westgate-on-Sea.

2nd, Thurs.—R.Ae.S. lecture. "Airship Mooring," by Flight Lt. F. L. C. Bitcher, and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.*

16th, Thurs.—R.Ae.S lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Instalment of Aeroplane Engines," by A. T. Rowledge.*

JANUARY—1921

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr H. W. S. Outram.*

17th, Thurs—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m.

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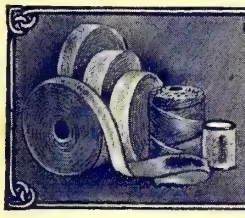

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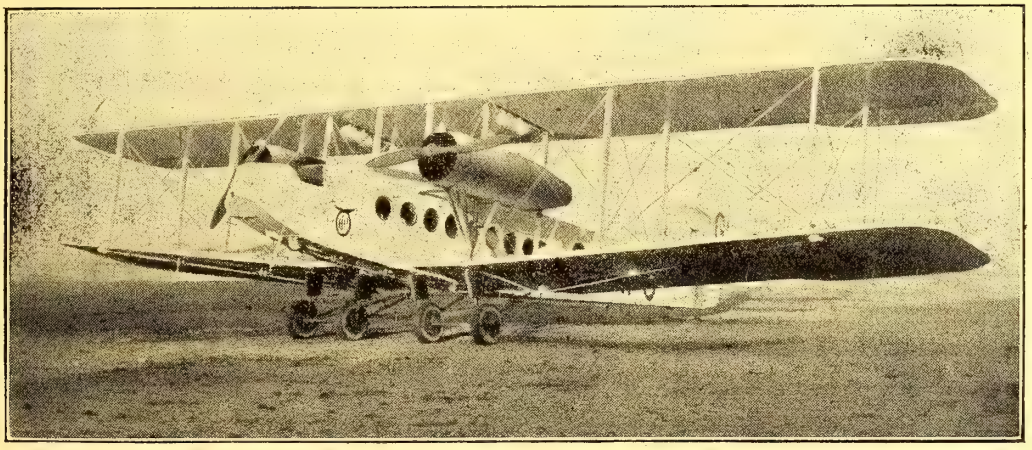

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ON THE NEEDS OF CIVIL AVIATION.—V.

The Ease of Prophecy.

There is a certain advantage in being an old, old man with a long memory. It enables one to size up more or less accurately in the light of history the position of affairs of to-day. On various occasions one has remarked that history is the greatest plagiarist in all literature. And a fairly accurate knowledge of what has gone before enables one to prophesy fairly accurately what is going to happen in the future.

After all, the prophets of the Old Testament were nothing extraordinary. They were only elderly men with long whiskers and a decent knowledge of history. It was dead easy for anybody who knew what had happened to Sodom and Gomorrah to prophesy what was going to happen to Israel. And it is just as easy for anybody who knows what happened in the French Revolution to prophesy what is going to happen in Russia. Similarly, it is easy for anybody who knows what English stupidity did in Ireland under Elizabeth, Charles I, Cromwell, William III, Anne, and the Georges to prophesy what it is going to do under Lloyd George.

An Historic Parallel.

Now, all those things are, in the broad view, mere parochial matters compared with the world-wide importance of methods of transport. Possibly the Mexican who is being revoluted, or the Armenian who is being beaten up by a fanatical Turk, or the harmless Irishman who is having his house burnt by drunken "Black-and-tans," regards his little personal discomfort as being much more important than such a matter as, say, the invention of a bicycle tyre or the design of an aeroplane wing. And yet the pneumatic tyre has had more effect on the development of the world in the past thirty years than have all the religious and political creeds put together. And, similarly, the improvement of aeroplane wings will affect the state of the whole world more in the near future than all our theories concerning Capital, Labour, Socialism, Syndicalism, Communism, Bolshevism, and all the other "isms."

There are those—chiefly those who made a lot of money out of making aeroplanes to other people's designs during the war—who will tell you that the aeroplane has reached its limit. Only the other day the head of a very big Sheffield steel firm said in a letter that, although aeroplanes are certainly useful as weapons of war, they can never be of any practical use as common methods of transport. He was blissfully ignorant of what is actually being done even with the quaint machines which we use to-day. And, of course, the possibilities of properly designed wings were away outside his comprehension altogether.

Thanks to one's long memory, one can remember exactly similar things being said about the bicycle, from which humble vehicle the motor-car and the aeroplane have developed. One has seen all three trades develop from their earliest days, and in each one has seen progress hampered by the same amazing stupidity on the part of the Government, the Public, the Press, and particularly the Manufacturers themselves. There is an exact historic parallel in each case.

The Bicycle and the Aeroplane.

Take the parallel between the bicycle and the aeroplane. One remembers about the year 1880 a much-daring and much older cousin possessing a tall bicycle on which he covered vast distances in the day, sometimes as much as 25 or 30 miles, and endured as much danger and ridicule as did those aviators who flew box-kites in 1910 or thereabouts. In fact, the high bicycle was probably responsible for more deaths in proportion to mileage than ever were the box-kites or primitive monoplanes of the 1910-11 period.

Then about 1885 came the so-called "safety" bicycle, which had small wheels and merely meant that one had not so far to fall. It had small solid tyres, which came unstuck and wrapped themselves round the forks or jarred the machine so that tubes broke or vital parts came unstuck, and it was quite fairly efficient as a man-killer. Also, it was so heavy and so hard to push that it never had a chance of becoming a universal method of transport. Only the young and athletic or the old and very tough were able to use it.

Yet it achieved a considerable amount of popularity and became in fact just about as near being a commonly used vehicle as is the aeroplane of the type which we know to-day.

A Curious Likeness.

Now here comes a curious likeness in the histories of the two vehicles. Somewhere about 1889-1890 the solid-tyred bicycle acquired such an amount of popularity that the cycle-making firms which already existed in Coventry and Wolverhampton (Singer, Swift, Rudge, Premier, Sunbeam, Star, were some of the names of the period) had had quite a little boom, which they thought a big boom, and were very heavily overstocked with complete bicycles and parts for the next few years. The solid-tyred bicycle had almost reached finality and the people who made them could see no room for improvement and no opening for a fresh market. Just as is the case with some of our aircraft people to-day.

Then all of a sudden there arrived in Coventry an affable gentleman named Ducros, who had made a tidy fortune out of paper bags in Ireland, and who had several athletic sons, Arthur, Harvey, and Alf being the best known at the time, who were notable cyclists and boxers—Willie and George grew up later. Mr. Ducros brought with him a strange bicycle with a species of sausage round the rims, the back and front forks being widened in a horrible manner to accommodate the sausages. Mr. Ducros said it had been invented by a veterinary surgeon named Dunlop and that it was going to revolutionise all road transport, just as Mr. Handley Page says that the wing discovered by his technical staff is going to revolutionise air transport.

All, or almost all, the good manufacturers of bicycles scoffed at this preposterous tyre, just as all, or almost all, our good manufacturers of aeroplanes scoff at the Handley Page and other so-called "freak" wings. Besides, if the tyre was right it meant scrapping nearly all the over-stock of bicycles they had in hand, and, being utterly English, they would much rather hang up progress and eke out a miserable existence selling obsolete or obsolescent bicycles than adopt the bold course, scrap the lot, and start out to make and sell pneumatic-tyred machines only. Which is very much the attitude of a good many aeroplane makers to-day.

Furthermore, all the "experts" of the cycle trade, works managers, designers, testers, and so forth, including the newspaper experts—except R. J. Mecredy, of the *Irish Cyclist*, and perhaps one or two others—proved conclusively that the pneumatic tyre was no use. It would puncture and burst, it was hopelessly heavy, it was a drag on the wheel and would decrease speed instead of adding to it. And so forth. It never struck them that by adding to the weight of the tyre it was possible to decrease the weight of the machine, just as by fitting wings which are heavier per square foot of surface it is possible to decrease the weight and power of the engine and so to decrease the weight of everything else in an aeroplane and increase the useful load.

The Patent Campaign.

In 1892 Charles Kingston Welch patented a detachable tyre with wired edges. This was bought by the Dunlop Company, and afterwards it was found that the Dunlop patent was never a patent at all, having been ante-dated by Thomas in 1840. About the same time one Bartlett patented the "Clincher"-edged tyre, which he sold to the North British Rubber Co. Then followed a regular rush of patents, all trying to get round the Welch and Bartlett patents. And the Dunlop and Clincher companies kept up a continuous series of actions to squash these infringing patents.

Towards the end it boiled down to these two patents only, and finally, about 1900 or so, the Dunlop Co. bought the Bartlett patents and ruled the roost, letting out licenses to approved manufacturers on reasonable terms. Meantime, between 1890 and 1900 pneumatic tyres had been so perfected that nobody ever sold a solid-tyred bicycle after about 1893, though "cushion" tyres survived till 1896 or so, as a kind of

half-way house, much as non-movable high-lift wings will probably survive when the majority of wings are of the variable surface type.

Though the period of patent actions has not yet arrived in the history of aeroplane wings—that will only come when the Trade is making money out of the new type machines—one can see the makings of plenty of law cases. There is the question as to whether the Handley Page patents cover the early Constantine experiments (*vide* Eiffel's big book). There is the question as to how far the dipping trailing edge patented by Mr. Fairey covers any "Venetian blind" movement in a wing composed of movable slats. There is the question as to how much Mr. Cecil Kny's monoplane of the 1911 show covers other variable camber devices, such as the Dayton-Wright. There is the question as to how Monsieur Garner's patent leading edge of 1914 covers other variable leading edges. There is the question of how far the Fokker, Alula and Junkers wings affect one another, though personally one regards them as being only "cushion tyres," as it were. And there are all the old "Varioplane" patents to be considered, besides probably some scores of others of which one has never heard.

At any rate, there is all the material for an exact parallel to the patent-action period in the history of the pneumatic tyre.

What is Needed to Renew the Industry.

Now what is needed to-day to put renewed life into the Aircraft Industry is general activity in the matter of these various "comic" wings, just as activity with pneumatic tyres in 1890-91 and 92 renewed the life of the moribund Cycle Trade and made possible the Motor Trade ten years later. If our aeroplane designers and makers are too stupid, or too self-conceited, or too poor to experiment on their own accounts, then one suggests that the R.A.F. has a magnificent opportunity of doing a service to the Industry in return for all that the Industry has done for the R.A.F. in the past.

Of course, where a maker is too prejudiced to do any experimental work in this line, he is best left alone. The less he does the sooner he and his firm will die and leave room for somebody more intelligent. And the sooner the better.

But where a firm is really working at the job, the R.A.F. can surely afford to give it some money for experiments, not by way of a subsidy, but by way of an actual order for an experimental machine to be built in the firm's works and afterwards delivered for test at Martlesham or Isle of Grain.

The R.A.F.'s Opportunity.

The R.A.F. would thus take all responsibility for infringement of patents. Suppose, for example, a firm wanted to build a machine with wings of the Handley Page type, then the R.A.F. would arrange with Handley Page, Ltd., about royalties and there would be no quarrelling between firms about terms.

One regards this as highly important, for there are some dozens of methods of achieving the results covered by the H.P. patents alone, and obviously Handley Page, Ltd., cannot afford to build them all at once. Yet it is of vital importance that those experimental wings should all be built at once so as to hasten progress and renew the life of the Aircraft Industry.

In fact, if the Controller-General of Supply and Research cannot find a number of firms to take on the job at reasonable prices, then he had better turn the whole of the resources of the Royal Aircraft Establishment onto the job and get dozens of wings of different types made forthwith, instead of wasting money on steam-turbines and helicopters.

If the development of the H.P. wing alone is left to one firm it will take three or four years to reach anything like perfection. If it could be perfected in a year from now it would mean that in 1922 there would be a very big boom in air transport.

The Creation of a Boom.

That seems a big claim to make, so it may be well to explain why. The success of commercial aviation depends entirely on cutting prices. People are not afraid to fly. It is simply that they cannot afford to fly. A hundred people went up in one machine at Croydon the other day in an hour and a half at 5s. a head. Would ten have gone up at £5 a head?

Cut the London-Paris fares to railway prices and people will go by air for preference, and then the boom in air transport will begin. And the only way to cut fares is to carry double the load on the same machines.

Now anybody could carry double the present useful load of passengers and goods on any existing machine by loading it more heavily per square foot of surface and flying faster. But a machine so heavily loaded takes a dangerously long run to get off and lands at a dangerously high speed.

All that the variable-camber wing or the H.P. "ventilated" wing does is to shorten the run and slow the landing. But that just makes all the difference between safety and danger. Which means all the difference between a commercial proposition and a sport for brave or reckless people only.

Safe and Dangerous Loading.

There is, as a matter of fact, plenty of margin for improvement on the best existing wings. A wing loaded to 15 lb. to the square foot is very heavily loaded. Yet if one could hit the air such a punch with the leading edge as to deflect it clean off the upper surface altogether, and so create a perfect vacuum, one would get a lift of 15 lb. to the square inch. And there is plenty to play with between 15 lb. to the square inch and 15 lb. to the square foot. It means, at any rate, a margin of 144 to 1. Even an addition of 2 lb. per square foot means only about one-fifth of an ounce per square inch.

Given a biplane of 40 ft. span and 6 ft. chord, one has roughly 480 square feet of lifting surface. Increase the loading only 2 lb. per square foot and one is able to carry 960 lb. of extra merchandise or five extra good fat passengers. Which means making the machine pay handsomely at much lower fares.

But that extra loading means danger in starting and landing, and so it is not a commercial proposition. Fit a variable wing which allows that heavily loaded machine to get off at 25 miles an hour, to fly at 120, and to land at 20, and one has the finest commercial vehicle in the world.

An Easy Proposition.

And it can all be achieved within the next twelve months if the Aircraft Industry retains as much intelligence as it possessed before the war—having mercifully been relieved of much of the befuddled brains which came into it during the war.

If the Industry itself cannot attain to such heights of intelligence, perhaps one's very good friend, Mr. Sydney Smith, of the R.A.E., will turn some of his bright young men onto the job, and will set about doing for aeroplane wings some such revolutionary experiments as he has been trying on aero-engines during the past twelve months or so. But one believes it will pay the Trade better in the end if it works out its own salvation and supplies of its own accord the needs of Civil Aviation.—C. G. G.

THE AIR POST OF BANKS.

The following correspondence has been received :—

Sir,—With reference to the announcements appearing in the issue of The Aeroplane of November 10th, I would point out that contrary to the statements made therein, this business is being proceeded with, and remains the property of the original proprietor—myself.

I would also bring to your notice that the announcements were not authorised by me or anybody connected with the business.

Having proved by the experimental run of the machines from September 13th to the end of October that a regular daily service can be satisfactorily maintained, the business is being reorganised by me with a view to its development as a limited company, and its further operations.

I should be obliged if you would kindly give publicity to the above.

I confirm what I informed you yesterday, when I had the pleasure of seeing you, to the effect that on the 3rd inst. I severed from all connection with this business Mr. Eric Neal and Mr. F. T. Courtney, and, therefore, nothing emanating from them can be considered as being on behalf of this business or myself.

I would also point out that I have been duly registered by the Registrar of Business Names as trading under the name of "The Air Post of Banks," and that also the name "Le Courier Aérien des Banques" has been registered in France, the fees paid for by me, and the name officially assigned to me, and therefore is my property.

With regard to the advertisement on page 778 in the issue of The Aeroplane of the 10th inst., the telephone number Mr. Neal has given turns out to be that of the Blackburn Co., from whom I was given to understand on telephoning them yesterday afternoon, that the use Mr. Neal had made of their telephone number was unauthorised.

(Signed) C. J. H. M. Kennedy, Proprietor.

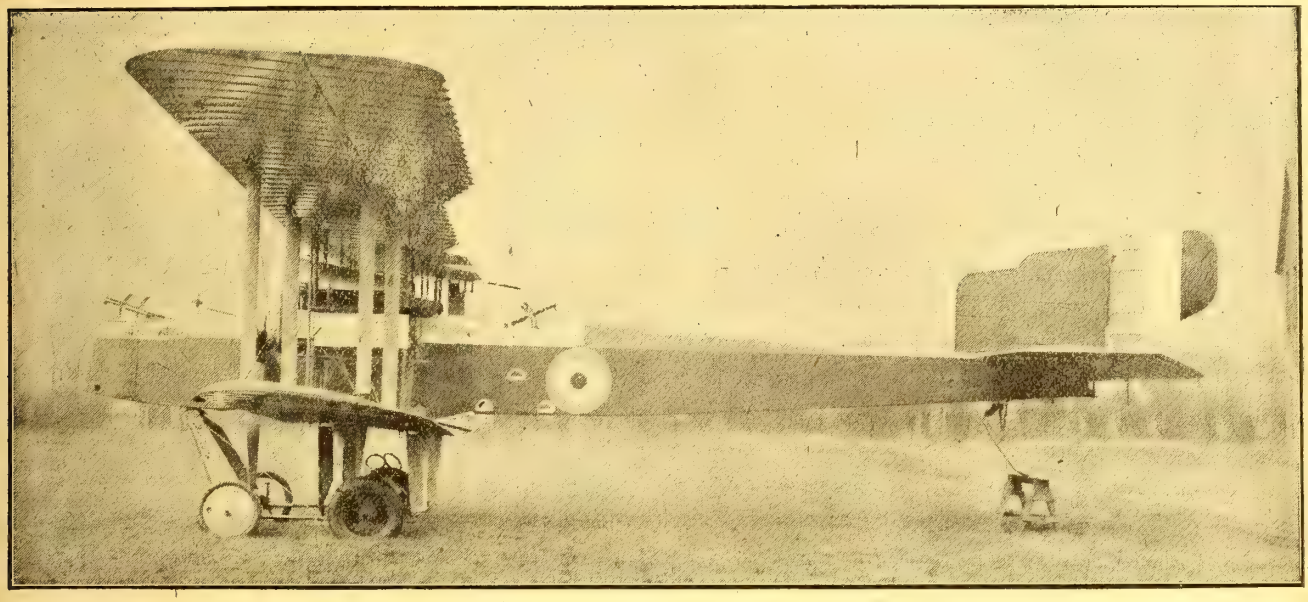
The following letter, dated Nov. 11th, 1920, has also been received :—

Sir,—With reference to the advertisement in The Aeroplane of this week, headed "Continental Air Services," and making use of my name, I shall be glad if you will mention in your next issue that this advertisement was given to you not only without my sanction, but very much against my wishes, a fact which you could not have known.

(Signed) F. T. Courtney.

A MATTER OF PRIORITY.

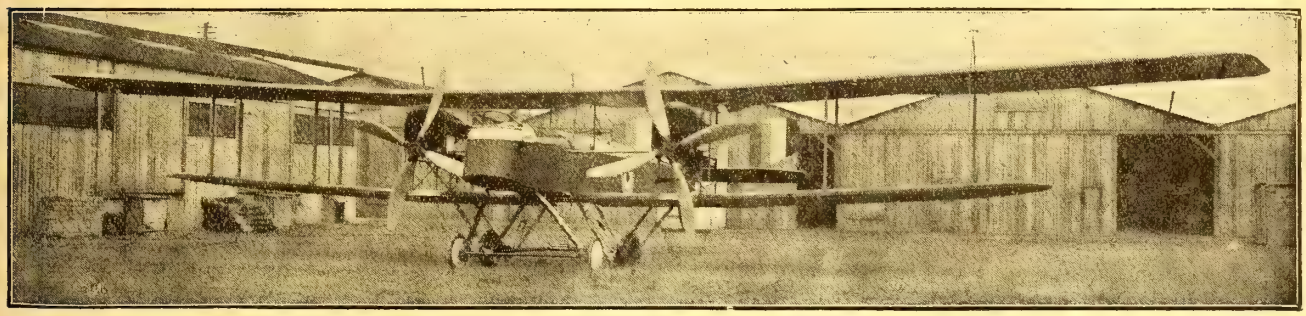
It is commonly supposed that the Germans produced the first multiple-engined Aeroplanes, at any rate of modern type. Just by way of showi g that the Fairey Aviation Co has not always confined its attention to Seaplanes, an early example of the firm's work is shown below:—



This is the Fairey, Twin-Engined, Folding-Wing, Bombing Biplane. It was designed by Mr. C. R. Fairey, in December, 1914. It was built in the Summer of 1916 It was de ivered in the Autumn of 1916. And it gave a performance superior to that of German or British machines of similar type produced a year later.

With two of the original "Falcon" Rolls-Royce Engines, giving 190 h.p. each, or 380 h.p. in all, her speed was 81 knots (92 miles per hour), and she climbed to 5,000 ft. in 6 minutes.

Her span was 77 feet. Her surface was 718 sq. ft. and her weight, fully loaded, was 4880 lbs.



Here She is seen in Three-quarter Front View.

It seems just as well that the pioneers of multiple-engined Aeroplanes in this country should make their work known, now that Civil Aviation all over the World calls for big passenger-carrying machines.

The Fairey Aviation Co., Ltd., is prepared to build Aeroplanes, Seaplanes or Flying-boats of a l types.

THE FAIREY COMPANY SPECIALISES IN PIONEERING.

THE FAIREY AVIATION CO., LTD.,

Head Office - - HAYES, MIDDLESEX.

London Office - - EMPIRE HOUSE, 175, PICCADILLY, W.1.
Works: HAYES, MIDDLESEX, & HAMBLE, near SOUTHAMPTON.

Telephones—19 Hayes, Middlesex.
394 Regent.

Telegrams—"Airily, Hayes, Middlesex."
Code—A.B.C. 5th Edition.

THE LANDING FEE QUESTION.

A recent article on the subject of pleasure flying has drawn from several firms the complaint that if they use their machines for passenger flying at a Government aerodrome it costs them the official landing fee every time they come down That is to say, if a standard Avro carrying two passengers does twenty trips in the course of an afternoon it has to pay 5s. landing fee every time it alights, so that in twenty trips the owner has to pay £5, which probably means the whole of his profit on the afternoon's work. In the case of a big machine it is just as bad, in that the owner has to pay a 10s. landing fee after each trip, whether the trip be a five-minute circuit at 5s. per passenger, or a journey of an hour or two costing several pounds per head.

One suggests that the fair thing for the Air Ministry to do is to charge each machine a landing fee for the day, after which the machine may make as many trips as it is able so long as the aerodrome personnel is not called upon to help handle the machine.

This landing fee regulation operates in a curious way, in that if a machine has had its engines overhauled and is taken for a test flight it pays no landing fee so long as it circles round and round inside the limits of the aerodrome, but if, in order to save trouble and wear and tear on the controls, the pilot takes it straight out for five miles and straight back again, then the machine has to pay a landing fee for each separate landing.

Presumably, if the regulations were strictly interpreted and a certain distinguished general officer late of the R.A.F. took up one of the small machines kept by the Royal Aero Club for the use of its members, and liable to a 5s. fee for each separate landing, the said officer would be charged about 30s. every time he returned from a trip in the air.—C. G. G.

A CRYING SHAME.

The attention of the more intelligent readers of this paper is drawn to the article by Capt. W. H. Sayers on page 789 of this issue concerning the peculiarly foolish operations of the so-called "Inter-Allied Commission of Control" which is apparently mismanaging our aeronautical interests in Germany.

It is of interest to note that the British section of this precious Commission has a distinctly Naval flavour. So far as one can recall there are no R.F.C. officers of any note on the Commission, and, with the exception of a few junior R.N.A.S. officers, there are few of any kind who have had any active service experience worth mentioning in the air, at any rate as pilots and observers over the enemy's lines. In fact the whole business of the Commission seems to have been conducted just as one would expect it to be done by Naval people.

The result appears to be, as indicated by Capt. Sayers, that the Commission has effectively prevented this country from deriving any appreciable benefit from its work, and in its unintelligent endeavour to damage German aviation it has in fact performed a considerable service to our Teutonic relatives.—C. G. G.

THE HELICOPTER PROBLEM.

Readers are reminded that M. Louis Damblanc, the leading experimenter in helicopters, delivers his lecture to the Royal Aeronautical Society at the Society of Arts, John Street, Adelphi, at 17.00 hours to-morrow (Thursday). The lecture will be read by Mr. Percy Noël. The chair will be taken by Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., Director General of Supply and Research.

THE BLERIOT WORKS CLOSED.

The Blériot aeroplane works at Suresnes has been closed down as from Nov. 13th last. M. Blériot states that this step has been made necessary by reason of the increased taxation, delayed payments, and the general industrial depression. These works have provided employment for 1,300 hands.

FELIXTOWE AIR STATION REUNION.

The first annual reunion dinner open to all ranks who served at the above air station will be held at the Connaught Rooms, Great Queen Street, on Saturday, Dec. 18th, at 7 p.m. Wing Commander C. E. Risk, D.S.O., will preside. Tickets 12s. 6d. each, applications for which must be accompanied by remittance at an early date, not later than Dec. 11th, from W. Kitson, 22, Manor Terrace, Felixstowe.

THE ARMAMENT SCHOOL, UXBRIDGE, DINNER.

The second annual reunion dinner of all officers who served on the staff at the R.A.F. Armament School, Uxbridge, will be held at the Holborn Restaurant, W.C.2, on Dec. 11th, at 7.15. For further particulars apply to the Hon. Sec., 32, Old Jewry, E.C.

AN ENGINE OFFICERS' REUNION.

On Nov. 12th a highly successful reunion of some sixty officers of the Engine Repair Shops at Pont de l'Arche was held at the Holborn Restaurant. Wing Commander C. B. Hynes, late O.C., E.R.S., was in the chair, and Air Commodore Brooke-Popham, Director of Research, was the guest of the evening. The Air Commodore, in a brief address, said that the E.R.S. had a splendid tradition of hard work and efficiency, and he hoped that the former officers would hand along their tradition to their successors. With this object, he said, the formation of some kind of E.R.S. society or club was being discussed, which might provide a kind of reserve of engine officers.

Wing-Commr. Hynes proposed that an organisation of this nature be formed, and all present signified their intention of joining. The subscription was fixed tentatively at 5s. per head, and Flying-Officer D. Drover, of the Air Ministry, consented to act as honorary secretary.

Squadron-Leader Verney, proposing the health of the Chairman, recalled various incidents in the formation and existence of the E.R.S., all of which should go to form traditions.

When the plans for the proposed organisation are a little further advanced one hopes to deal with them more fully. Meantime, will all former E.R.S. officers who may be interested in the scheme communicate with F/O Drover?

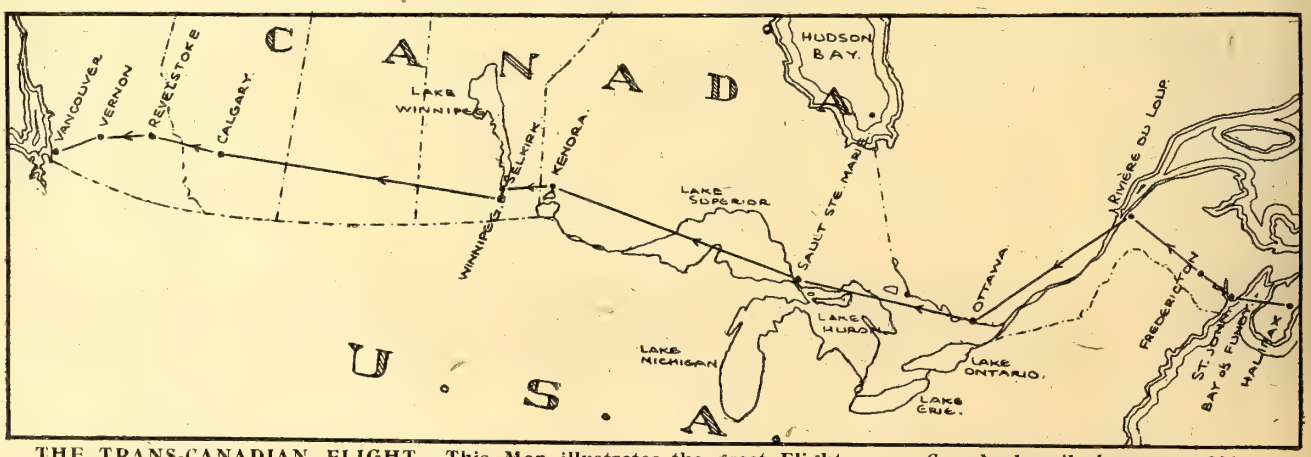
NO. 3 WESTERN AIRCRAFT REPAIR DEPOT REUNION.

The first reunion dinner of the Officers from the Yate Depôt took place on the 12th inst., and was a most successful and enjoyable gathering. It was organised by the late Commanding Officer, Lieut.-Col. R. G. Law Markham, who also occupied the chair. Considering it was a first attempt, the muster of 40 must be regarded as very creditable.

After the loyal toast, Lieut.-Col. Law Markham proposed the "R.A.F. in Being," pointing out that the officers present, most of whom had returned to civil life, had taken a material part in preparation for the R.A.F. as it now was. Serious efforts were now being substituted for Comedy in organisation and administration, and he expected that in a very short time it would be universally recognised as a Service in all respects equal of the two Senior Services, and one into which we should be proud to enter our sons.

Flying Officer T. V. Villiers replied in a humorous speech with reference to Yate and to officers who were there and were now present. This was followed by the toast of the Chairman, proposed by Major T. E. Robertson, O.B.E.

It was unanimously decided to repeat the meeting, and a committee was elected to take the necessary steps to form a Yate Officers' Association.



THE TRANS-CANADIAN FLIGHT.—This Map illustrates the great Flight across Canada described on page 801.

THE STORY OF SHELL SERVICE. I

Reproduced from E. McKnight Kauffer's famous hoarding at Shell Corner, Kingsway, London.

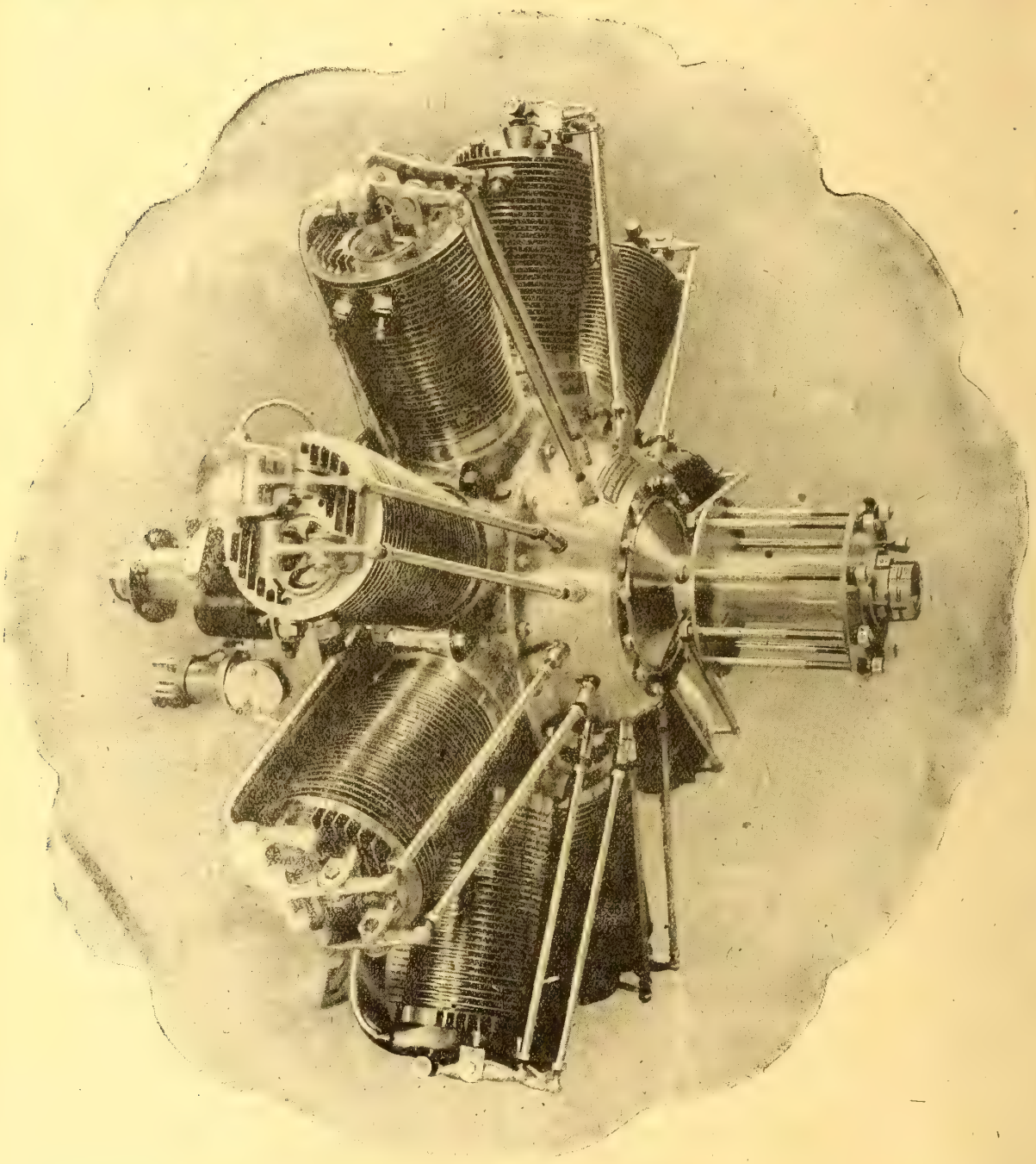
THE Crusader of old provided himself with a Shell, wherewith to drink at the springs on his pilgrimage. The Shell thereupon became the emblem of Service to the traveller. Similarly, to-day it symbolises Service to the motoring traveller, in the provision of the finest motor spirit the world produces—"SHELL."

SHELL

The QUALITY Motor Spirit

SHELL MARKETING CO., LTD., KINGSWAY, LONDON, W.C.2

GWYNNE'S AERO ENGINES



Manufacturers of the B.R. and all types of Aero Engines.
Sole Licensees for British Empire of Clerget Motors.

GWYNNES Ltd., Hammersmith Iron Works, LONDON, W.6.
"Gwynne, London." *"Hammersmith 1910."*

Contractors to the Admiralty, War, Indian and Colonial Offices, and the principal Foreign Governments.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

The relics of German aircraft which are at present at the Marine Aircraft Experimental Station at Grain are described below, after a comment upon the disgraceful ill-usage to which they have been subjected before their arrival in this country.

A description of the exhibits at the International Aero Exhibition recently held at Prague will be found on page 792.

The French Nieuport, winner of the last of the Gordon Bennett races, and the American Dayton Wright entry for the same race, are described and illustrated in this issue.

RELICS OF THE WORK OF THE INTER-ALLIED COMMISSION OF CONTROL.

One who should know states that in German aeronautical circles the Inter-Allied Commission of Control is generally regarded as a heaven-sent blessing, on the ground that as it has forced Germany to scrap all its obsolete aircraft, together with much of the specialised workshop equipment designed for the production of these machines, without being able to delete the knowledge and experience which German constructors have obtained in the last few years, all future German aeroplanes will be built on the basis of that knowledge and experience, free from the cramping effect of a desire to make use of existing parts, jigs and dies, which would inevitably result had they been allowed to retain their existing machines and equipment.

Our Kindness to the Hun.

And there being no surplus stocks of unwanted war craft for sale at cheap rates, any German commercial aircraft put into service will have to be designed specfically for that purpose.

The Allies will remain for some time content with the using up of war derelicts, and during those years their designers will starve. When aerial transport comes into its own and a real demand for economical aeroplanes arises, German designers will alone possess the knowledge, and German constructors the experience to meet the demand.

This view is by no means an unfounded one. There are many cases on record of old-established firms which have been steadily relapsing into that state of senile conservatism which ultimately leads to ruin, who have been rejuvenated by the occurrence of a fortunate fire which has forced them to replace, by modern equipment, obsolete plant which otherwise would have continued to waste labour and money for years.

Unfortunately it is little use for this paper to agitate in favour of a revision of the Treaty of Versailles, and therefore German Industry must be left to enjoy the benefits afforded to it by that Treaty.

An Excess of Zeal.

Unfortunately, those members of the Commission of Control who are charged with the supervision of German aerial equipment do not seem to have been content with the purely passive assistance which it is their duty, under the Treaty, to afford to German designers.

Not merely are they removing from our late enemies all temptation to handicap their aerial enterprises with obsolete material, and leaving to them all their accumulated experience, but they appear to have taken very effective steps to prevent British designers from acquiring any useful knowledge of actual German achievement in aircraft design.

There are at the present moment, stored in the sheds of the Marine Aircraft Experimental Department at the Isle of Grain, a large number of parts of German aeroplanes and seaplanes which have been deported from the land of their origin in order that the British Technical Authorities may examine in detail examples of the latest and most interesting products of the German Aircraft Industry.

Wanton Destruction.

So far as can be discovered, the *modus operandi* which has been followed has been that firstly the Inter-Allied Commission of Control have destroyed "everything come handy" to the best of their ability. Then the wrecks produced have been examined by the junior, and presumably least unintelligent officers attached to the Commission, who have selected from the junk large quantities of parts which appeared to them of interest.

These parts were transported to Belgium, after all impediments to packing had been removed with hammer and axe, and there dumped for some months. Then they came within the range of vision of certain members of the Technical Department of the Air Ministry, who finally selected that which should be brought to this country.

As to the final selection, there is no room for criticism. There is nothing at Grain at this moment that is not of very great interest indeed. But unfortunately the value of the collection has been enormously depreciated by the brutal and ignorant ill usage to which most of the material has been subjected.

There are very strong grounds for believing that the Germans themselves had no part in the damage. On the contrary there are evidences that they are proud of their aerial products, and that they have enough confidence in in their own designing abilities not to fear the efforts of the mere copyist. They have even taken the trouble to mark many of the samples now in this country with the words "Made in Germany," painted on in conspicuous positions.

The damage is not of the type which is done by an intelligent person wishing to destroy evidence, it is very distinctly of the type which results from ignorance and laziness combined.

Instrument connections, or control wires, etc., have been torn off, rather than take the trouble to disconnect them properly. In consequence, instruments of distinct interest have been wrecked, and it is impossible, not only to test the instruments, but even to determine how they were connected.

There are two Junkers all-metal machines—one of the armoured biplane type, and one of the two-seater monoplane class.

Both these machines could have been tested for performance and for structural strength, and some really useful data on metal construction might have been available, had they been packed for transport with the least intelligence. But although someone has taken the trouble to crate the tail and wings of the monoplane, the crates appear to have been packed in the bottom of a truck with a ton or two of odd engines loose on top, with the result that certainly the coverings and probably the internal structure has been very seriously damaged.

The whole consignment bears obvious traces of having been entrusted to the tender mercies of one of those en-

lightened gentlemen whose habit it is to " 'eave 'arf a brick" at any stranger—merely because he is a stranger.

THE INTERESTING RESIDUE.

Despite the very thorough way in which the Inter-Allied Commission have done their deadly work, the remains are of very considerable interest, and are well worthy of study.

Of the whole three sheds full of remains there is only, as far as can be gathered, one machine which can be assembled and tested.

This exception is one of the two-seater Brandenburg sea monoplanes, fitted with a Benz six-cylinder vertical supercompressed engine, apparently of the B.Z.4 type.

This is a somewhat curious coincidence, in that the managing director of the Hansa-Brandenburg firm has expressed a very strong objection to supplying any technical details of these products to Allied countries.

There are certain very interesting remains of giant aircraft. Among them is the front part of the fuselage of the Linke-Hoffmann R.11 machine, described in this paper on Sept. 24th, 1919.

In this, it will be remembered, four 260 h.p. Mercédès engines are installed, all geared together, and all driving one single tractor airscrew. The four Mercédès engines are still in position in the engine room, but the gears have been dismantled, and although there are parts of the transmission actually at Grain, there is probably not enough to reconstruct the gear arrangement. One side of the curious steel spring undercarriage (illustrated in the aforesaid issue of this paper) has also been salved.

In addition there are three front halves of fuselages of Zeppelin-Staaken giants. Of these one is of the five-engined type with a tractor in the nose driven by a single engine. A second is that of the experimental machine which was fitted with a supercharger. This was referred to and illustrated in an article published in this journal (page 1213 of June 23rd, 1920). The supercharger was of Brown-Boveri make, driven by a separate 110 h.p. Mercédès engine installed ahead of the pilot's seat.

The supercharger itself has been removed, but the engine driving it and the whole of the compressed air connections and controls within the fuselage remain.

The third is of the ordinary four-engined type of machine, and the most interesting feature is the very elaborate signalling installation to the mechanics in the power eggs, and the curiously arranged engine controls. Unfortunately, owing to causes already dealt with, it is difficult to trace out the connections and operations of these controls.

The signalling gear consists of a board, some 10 in. by 12 in., having on its face some 20 little glazed windows, behind each of which is an electric lamp, and below each a switch, and above each a printed signal.

A NEW " STAAKEN " VARIETY.

Of Staaken remains there are also two interplane power eggs, each with its two engines in tandem. One is of the usual type and contains two 260 h.p. Maybach engines. The second shows a hitherto unrecorded power plant arrangement, of a front six-cylinder vertical Benz engine (probably of 220 h.p.), with one of the 12-cylinder, Vee, 500 h.p. engines of the same make at the rear. This latter drives its propeller through an extension shaft and a colossal separate reduction gear.

This gear is of the plain spur type, with gears some 4½ in. in tooth width, and of very coarse pitch. From the appearance of the aluminium housing it would appear that the reduction ratio was well over two to one, and that the diameter of the wheel on the airscrew shaft was at least 14 in. This particular gear was made at the Zeppelin Co.'s gear works and, together with its shaft, occupies as much space, and looks as though it must weigh as much, as a 150 h.p. Hispano-Suiza engine complete.

Of other recognisable remains are two of the gearboxes used in the Siemens-Schuckert six-engined four-screwed giant. Photographs and drawings of these gears will be found in THE AEROPLANE, page 1172, June 16th, 1920. As far as can be seen they are in perfect condition, and it would seem well worth while to have them tested to destruction under continuous pull load, driving airscrews, and driven by aero engines, under a reasonably close imitation of the designed working conditions.

Of smaller machines there are the fuselages of a Sablatnig night bomber—a very neat and light-looking three-ply structure—of a Roland type D.VIb, showing the curious "clinker-built" construction, and of a number of other recent single and two-seaters of no very marked interest. In addition, there is a nearly complete Fokker D.VIII cantilever monoplane, which it may be possible to assemble.

It is hoped that, when the technical staff at Grain has had time to examine, measure, and consider the assembled material, a fully descriptive report on these relics will be issued to those interested.—W. H. S.

BOOK REVIEWS.

A TREATISE ON AIRSCREWS. By Whyrill E. Park. (The D.U. Technical Series, Chapman and Hall. 21s. net.)

This, the second of the "Directly Useful" series of technical books devoted to aeronautical subjects, is, in accordance with the intention of the series, an attempt to give a clear idea of the underlying principles of airscrew design, together with clear instruction as to the application of those principles to practical design and construction.

The author's experience of successful airscrew computation during a number of years with Lang Propellers, Ltd., should suffice to ensure that the methods indicated by him for design purposes are reliable; the arrangement of the book itself proves him to be possessed of that gift of clear and orderly exposition which are as essential as knowledge itself to the writing of such a treatise.

The book can be strongly recommended to all students who require a plain and straightforward information of the type required successfully to design efficient airscrews.

THE DESIGN OF AEROPLANE ENGINES. By John Wallace. (Published by Benn Bros., Ltd., *Aeronautics* Offices, 8, Bouverie Street, E.C.4. Price 15s. net.)

There has long been room for a book treating simply and clearly with the principles of design of the aero-engine. There have been published during the past twenty years numerous text-books dealing with the internal-combustion engine, and some of the later of these have mentioned aero-engines. But the majority of such works have been either treatises on the applied thermodynamics of the internal-combustion engine, draughtsmen's handbooks of proved and tried detail design, or popular and inaccurate guides for the use of amateur motor tinkers, and have thrown little light upon the specialised problem of the aero-engine.

Mr. Wallace's little book deals solely with the practical side of aero-engine design. Thermodynamics are neglected, it being assumed that the explosion of a petrol-air mixture will produce the results which are known to occur in practice, but the actual mechanics of turning that explosion to practical account are dealt with simply but thoroughly. To all those who are charged with the care and maintenance of aero-engines the book will supply useful information as to the why and wherefore of various types and arrangements of aero-engines.

To those who desire to attack the problems of aero-engine design it will give a very clear statement of what those problems are and what methods are available for their solution.

MODEL AEROPLANING: ITS PRACTICE AND PRINCIPLES. By V. E. Johnston, M.A. (London: E. and F. N. Spon, Ltd.)

In the opening paragraph of this book the author states: "The object of this book is . . . to narrate in plain language the general practice and principles of model aeroplaning."

This is, of course, a very worthy object. The principles whereon model aeroplanes operate are exactly those whereon full-size aeroplanes operate, and a widespread knowledge of those principles can be spread by the agency of models among circles who can have only limited opportunities of gaining such knowledge from experience with real aeroplanes.

It is therefore regrettable that Mr. Johnston should have so far fallen short of his avowed object. In places his language is far from plain, and his statements of principle can scarcely be regarded as altogether well founded.

Otherwise the book contains a fair amount of practical information which should be of value to those who are interested in the very fascinating hobby of model aeroplane building and flying.

AERONAUTICS AT THE SCOTTISH UNIVERSITIES.

It is of great interest to learn that the Scottish Universities have included for the first time Aeronautics in their Engineering course this year. At Gilmorehill, in Glasgow, what is known as a "half-graduation" course, consisting of 12 lectures, will be given on this subject. The course has been mapped out in collaboration with the officials of the Scottish Branch of the Royal Aeronautical Society, and the services of very able men have been secured to deal with the different features.

Mr. L. Bartlett, of the Royal Corps of Naval Constructors, who is at present stationed at the Inchinnan Airship Construction Works of Messrs. William Beardmore and Co., Ltd., has undertaken lectures dealing particularly with rigid airships. He will deliver two lectures in Glasgow, two in Edinburgh and one in Dundee on the subject of "Rigid Airships—Design and Construction."

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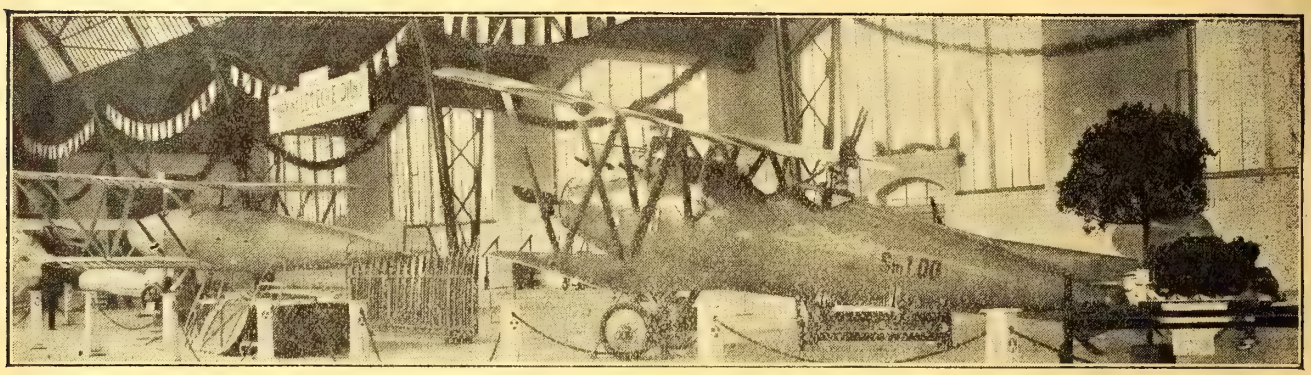
THE FIRST INTERNATIONAL AERO EXHIBITION AT PRAGUE.



THE PRAGUE EXHIBITION.—The Stand of the "Hlavni Letecke Dilny" with two of the "Smolik" type Biplanes.

The following account of the Prague International Aero Exhibition, held from Oct. 23rd to Nov. 2nd, is due to Mr. Frank Pokorny, of the Czecho-Slovak Press Agency in London.

The first International Aero Exhibition arranged by the Czecho-Slovak Aero Club at Prague was a remarkable success for Czecho-Slovak enterprise. This industry, comprising a comparatively small group of individuals and firms, has achieved in the last two years more than could have been expected, and surprised not only the foreign visitors, but also the native industrial circles. The aeroplanes and motors exhibited, as well as all the other products used in connection with aeroplane manufacture, were of first-class make.

The most noticeable feature of the show was the Prague "Aero" Company, although all the Czecho-Slovak firms of repute were represented. The exhibits of the "Aero" Co., however, attracted most attention, its products being the result of the latest and most accurate scientific research. During the one year of its existence the company has produced 21 aeroplanes ("Aero 10") and has gained a good reputation also in foreign countries.

The "Avia" Co. exhibited aircraft of a new pattern: a very good machine, intended for sporting purposes, with a 35-40 h.p. Daimler engine. M. T. G. Masaryk, President of the Republic, in appreciation of the efforts of the two constructors, engineers Benes and Hain, presented them with a gift of 100,000 Czecho-Slovak crowns from his private purse, to enable them to continue their research.

Of the aerial omnibuses, the aerolimousine of the "Ikarus" Co. attracted much attention. It is an aircraft, type Brandenburg with a Breitfeld-Danek engine. The passenger traffic of this company has been about 2,400 persons during the last year.

The "Hlavni Letecke Dilny" (Principal Aero Works) had a very good set of exhibits in which aircraft was shown designed for passenger traffic. This company produces machines type "Smolik," with 230 h.p. engine, also for export.

Of other machines exhibited, those produced by the West-Bohemian Avralie Club, Pilzen and Moravian Aero Club, deserve special notice.

In the engine section were the well-known engines of the Breitfeld-Danek Joint Stock Co., type "Hiero"; the "Aero" Co., and an engine produced by Mr. Urban, Pilzen. Mr. Urban's engine was for a long time the only foreign engine used by the French air services.

Of foreign firms there were French machines of Bréguet, with a 300 h.p. Renault engine, made entirely of metal (this type of aircraft is used by the Czecho-Slovak Army), and Henry Potez, with a 400 h.p. Lorraine engine (SEA model), which is used by the French-Rumanian Aviatic Co. for the air transport between Paris-Prague-Bucharest).

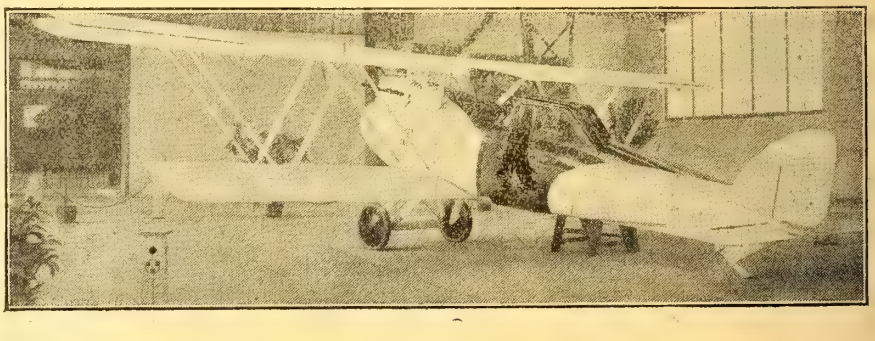
It is a great pity that there were no British products exhibited. British help would be very much appreciated, especially in this branch, as the Czecho-Slovaks are unable to produce as much as they want and would be good buyers of British aircraft.

The exhibition as a whole proved a great success and left a good impression throughout the whole country. It offered further evidence that Czecho-Slovak industry is capable of competing with the West-European industries.

The manufacture of aircraft has a promising future in Czecho-Slovakia. The most important lines of European air transport lead *via* Prague, which is destined to become an important centre of commercial aviation.

An international commercial aerodrome will be established in Prague and the capital of Czecho-Slovakia, which is the centre of a circle whose radius is 600 miles, covering all the important commercial centres, such as London, Paris, Marseilles, Rome, Warsaw, Riga and Stockholm, is taking energetic steps to derive the maximum of advantage from its favourable position.

A Czecho-Slovakian Passenger Machine. Exhibited at the Prague Aero Show, this machine, built by the Hlavni Letecke Dilny (Principal—or Central—Aero Works), is evidently a conversion of one of the two-seater war types illustrated above.



COURSES FOR AERONAUTICAL STUDENTS

It is announced that the Department of Aeronautics, of the Imperial College of Science and Technology, South Kensington, have arranged for two full-time courses for the session 1920-21. One course deals with Aeronautical Engineering, the other with Meteorology and Navigation.

A New Italian Giant.

The Italian corespondent of THE AEROPLANE writes:—

The following details, which in general terms correspond to what has been commonly known for months or more as to the Caproni aerial liner, are published by a responsible sporting journal. The machine—which is a seaplane, though the paper does not say so—is a triple triplane or nine-planed machine. The number of the motors, which are, as might appropriately have been guessed, American, is eight, which if they are of 350 h.p., as stated, would give 2,800 horse-power. The passengers are reported as going to be 120, which will encourage those who believe that in numbers lies safety.

The giant is nearing its test flight at Sesto Calende, where the Caproni firm have had for some years a large shed with works annexed, where, too, the hydro-triplane was erected and tried—T. S. H.

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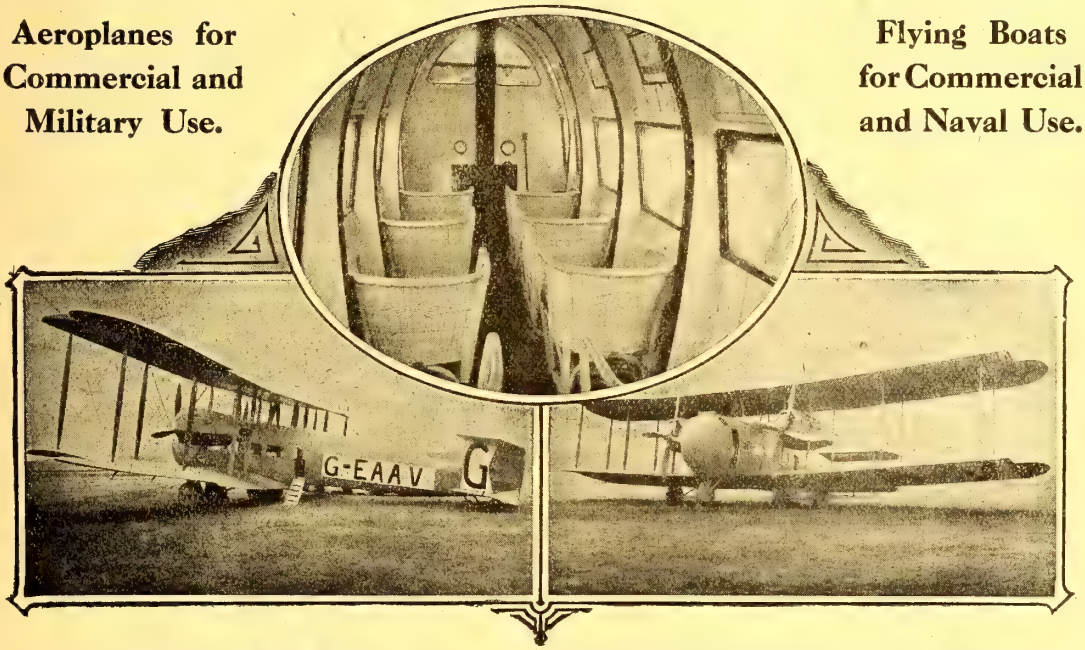

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BIRMINGHAM—Vickers House, Loveday Street.
NEWCASTLE—Commercial Union Buildings, Pilgrim Street.
GLASGOW—75, St. George's Place.
BRISTOL—55, Park Street.
NORWICH—16, White Lion Street.
BELFAST 26a, Arthur Street.

TRADE NOTES.

Metal Airscrews.

During the preliminary trials of the Bristol "Tourer" seaplane (illustrated in the issue of Nov. 10th) a considerable amount of trouble was encountered with the ordinary type of wooden airscrew. Spray and rain caused serious damage, which set up very considerable vibration when taxi-ing. A Leitner-Watts metal airscrew was substituted for the wooden one and the troubles were at once overcome.

The particular airscrew was one of the early examples of the separate blade type, wherein standard blades of various dimensions can be inserted into standard bosses and the pitch and angle of the blades adjusted by a screw setting to suit the particular engine and aeroplane. The blades used were hand-beaten to shape and riveted instead of being spot-welded, and they are naturally less uniform and less efficient than will be the pressed and welded blades which are now to be manufactured.

Despite this, tests made on the "Tourer" showed less vibration, distinctly less noise, and a slightly higher speed at 5,000 ft. than did the standard wooden airscrew.

Metal Airscrews, Ltd., may be congratulated on the results of their long and persevering efforts to produce a cheap and satisfactory steel airscrew, and the Bristol Aeroplane Co. on their foresight in recognising and testing a useful novelty.

Firth's Carbon and Alloy Steels.

Thos. Firth and Sons, Ltd., have just issued a booklet dealing with their Carbon and Alloy Steels, which is to be added to the series of catalogues published by them. It has been produced essentially for the convenience of the busy man, and as such the booklet is arranged in a particularly simple and concise manner. In addition to such items as "Notes on Mechanical Testing," "Notes on Case Hardening," "Useful Tables," there are such headings as "Steels recommended for various purposes," and "Full particulars of Steels," etc., all of which make the book extremely useful for reference purposes.

Anyone concerned in the uses of High Grade Carbon and Alloy Steels for aircraft, automobiles, etc., should certainly apply for a copy to Thos. Firth and Sons., Ltd., of Sheffield and 8, The Sanctuary, London, S.W.1.

Cellon Dope.

Mr. A. J. A. Wallace Barr informs one that, at the present moment, Cellon (Richmond) Ltd. have contracts for no fewer than six governments. This does not look as though the Aircraft Industry is as dead as the pessimists would have people think.

It seems a great pity that more firms, particularly those running air lines, do not go in for Mr. Wallace Bair's scheme for registered colours for machines. Dope can be made in most colours just as well as in white and aluminium, and in some cases better. It would enhance the appearance of machines as can be seen from the Martinsyde "Semiquaver" or the Farman "Goliaths."

The Air Force have decided on aluminium as their colour, and A.T. & T. go in for black and silver. It is up to the more progressive firms to fall into line. The Nieuport idea of "small check" rather defeats this object by appearing a neutral tint at quite a short distance, but those who saw the Aerial Derby will remember the glint of red as soon as "Semiquaver" came into sight.

Moreover, in order to get the full benefit of this scheme, machines have to be kept scrupulously clean, which in the end, as most of those who served in the R.A.F. will be the first to admit, leads to efficiency.—G. D.

Nothing Succeeds like Success.

The many friends of Mr. and Mrs. H Latimer-Voight will be glad to hear that Mr. Voight, formerly managing director of the Integral Propeller Co., Ltd., and of the Pegasus Aircraft Co., Ltd., has been awarded a testimonial inscribed on parchment by the Royal Humane Society for "having on Sept. 4th, 1920, gone to the rescue of two boys at Kingsgate who were in imminent danger of being drowned, and whose lives he gallantly saved." Congratulations to Mr. Voight on this new manifestation of his versatility. Having been in turn a successful manufacturer, and a soldier during the war, and a successful merchant since peace broke out, he now appears as a volunteer life-saver, in which rôle he has proved equally capable.

COMPANY NOTES.

New Company.

Air Navigation Company (Scotland) Limited.—Private company. Registered in Edinburgh, Oct. 26th. £2,500 in 2,000 shares of £1 each and 2,000 shares of 5s. each. To acquire the business of the Air Navigation Co., aeronautical engineers, air-line operators, inspectors, surveyors, promoters of aviation and other companies, etc. The first directors are: C. P. Jenkyns, 23, Bellwood Street, Langside, Glasgow, engineer; R. W. Collins, 1, Deanbrae Street, Uddington, engineer. Registered office: 219, St. Vincent Street, Glasgow.

Mortgages, Charges and Satisfactions.

Lang Propeller, Ltd.—Particulars of £5,000 debentures, authorised Oct. 15th, 1920; present issue £1,000, subject to no further debentures being issued without the consent of Gwynne's Engineering Co., Ltd.; charged on certain land and premises at Chertsey and company's undertaking and other property, including uncalled capital.

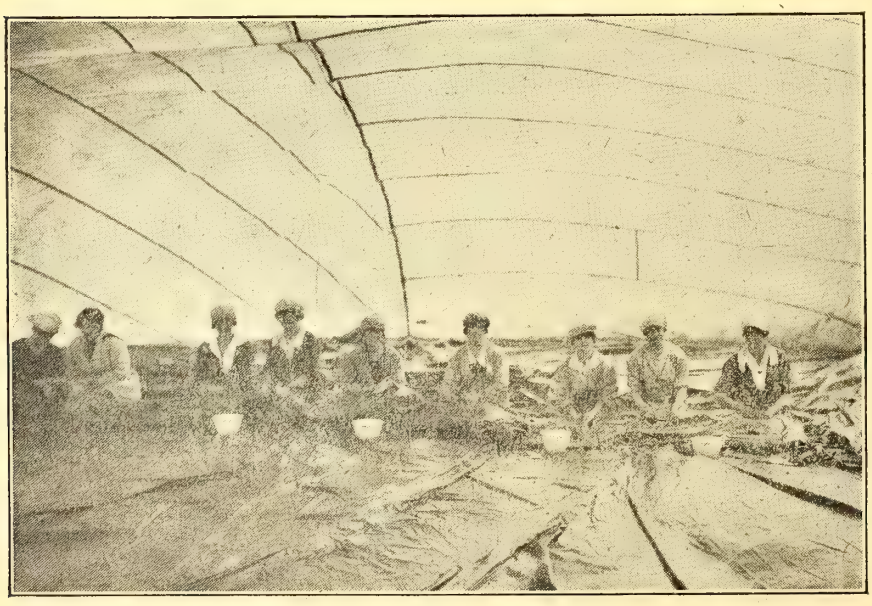
Midland Motor Cylinder Co., Ltd.—Satisfaction to the extent of £500 on April 30th, 1918, £500 on Jan. 31st, 1919, and £1,500 on Oct. 28th, 1920, on mortgage dated Dec. 31st, 1917, securing £2,500.

Flightcraft, Ltd.—Particulars of £2,700 debentures authorised Oct. 15th, 1920, whole amount issued; charged on the company's undertaking and property, present and future, including uncalled capital subject to prior debentures.

Receiverships.

Wessex Shipbuilding and Manufacturing Co., Ltd. (formerly Wessex Aircraft and Shipbuilding Co., Ltd.).—J. H. Stephens, of 6, Clements Lane, Lombard Street, E.C., as receiver and manager by order of Court dated Oct. 21st, 1920.

Sussex Aero Club, Ltd.—Major C. W. Breadmore, of Wyke Hill, 188, Stockbridge Road, Winchester, as receiver and manager, on Oct. 11th, 1920, under powers contained in debentures dated May 22nd, 1919.



INSIDE A GIANT AIRSHIP GASBAG.—A photograph taken at the Inchinnan Airship Construction Works of William Beardmore and Co., Ltd., showing women workers engaged in rectifying and touching-up the fabric inside one of the giant gasbags which this firm is making for the R.38. This is the largest bag Wm. Beardmore, who are the builders of R.34, have ever made; it measures over 80 ft. in diameter. After the fabric has been skin-lined in panels, it is assembled into a complete unit and then has to be inflated on the floor with hot air so that a scrutiny of all joints and fittings may be made inside.

WESTLAND

Telephone No.: REGENT 8000.
Telegraphic Address "AIRMINISTRY, LONDON."
(All telegrams on the subject of this letter should quote the undermentioned Air Ministry Refce.)

AIR MINISTRY,
~~STRAND~~,
LONDON, W.C.2.

October, 1920.

All letters on the undermentioned subject should be addressed to THE SECRETARY at the above address and should quote

Air Ministry Refce. 344425/20 (C.G.C.A.) Your Refce.

SUBJECT:— Air Ministry Competitions, 1920.

Oct 18 RAB

Gentlemen,

I am commanded by the Air Council to forward, herewith, a draft for £7,500, being the first prize awarded to your Westland Six Seater machine in the Small Aeroplane class in the recent Competitions.

I am,
Gentlemen,
Your obedient Servant,

J A Wetts

Enclosure.

Messrs. Westland Aircraft Works,
Yeovil,
Somerset.

THE WESTLAND AIRCRAFT WORKS
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YEOVIL
have been awarded the FIRST PRIZE of £7,500 in the
British Aircraft Competition, 1920 (Small Class)
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WESTLAND SIX-SEATER LIMOUSINE
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The result of the Competition is to stamp the WESTLAND LIMOUSINE with the hall mark of excellence for Aerial Transport. We invite enquiries for these machines, and are prepared to grant licences for manufacture abroad.

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BEARDMORE AERO ENGINES have been associated with many of the wonderful achievements of the Air Services during the war, and British aerial supremacy is in no small way due to the great RELIABILITY of the engines used, of which the BEARDMORE was the most famous. From the earliest days of flight experts have been enthusiastic over Beardmore EFFICIENCY, ECONOMY and TRUSTWORTHY SERVICE. Manufacturers are largely specifying Beardmore as Standard Post-War Power Units.

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AeroEngines

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

The Australian Aircraft & Engineering Co., Ltd.

The Australian Aircraft and Engineering Co., Ltd., have during the summer months done considerable business both from the flying and selling point of view. The company have secured more sales than any other firm in Australia, this being attributed to the fact that they are in a position to build machines on the spot. Their total sales since they commenced operations at the beginning of the year are :—

One Avro 504K (110-h.p. Le Rhône) to the Northern Queensland Graziers' Association.

Two Avro 504Ks (130-h.p. Clêrget) to the A.A.E. Co., Ltd., for demonstration purposes.

One Avro 504K (110-h.p. Le Rhône) to A. V. Roe and Co. for demonstration purposes.

One Avro 504K (130-h.p. Clêrget) to Mr. Tatton, of Hastings, N.Z., for passenger-carrying.

One Avro 504K (100-h.p. Sunbeam "Dyak") to Mr. P. Heyde, of Nimitybelle, N.S.W.

One Avro 504K (100-h.p. Sunbeam "Dyak") to Mr. Leresche, of Walgett.

Two Avro 504Ks. (100-h.p. Sunbeam "Dyak") to the Auto Aero Services, Ltd., Queensland.

The Avro bought by the Queensland Northern Graziers' Association, which was an imported machine, was delivered on Aug. 13th by Lieut. Adair from Sydney to Brisbane, a total distance of 500 miles at an average air speed of nearly 100 m.p.h. A non-stop flight from Newcastle to Grafton of 240 miles during the course of the delivery flight constitutes an Australian record for rotary engines. The purchasers have extensive properties in N. Queensland, and the machine will be used by the managers of the Association on station inspections and visits to and from Brisbane. The two machines ordered by the Queensland Auto and Aero Services, Ltd., will be used between the railheads of a certain part of Queensland.

A machine belonging to the A. A. and E. Co., Ltd., has been operating in Brisbane on propaganda work, which resulted in numerous inquiries and the sales mentioned above.

Peace Loan Flying.

The Peace Loan Flights have been rather unfortunate. One machine flown by Lieut. Cummins crashed in Tasmania, resulting in slight injuries to the passengers, and another, piloted by Lieut. Rees, crashed at Kiama, N.S.W. The other machines arrived safely at their destinations after numerous stoppages. These misfortunes can be attributed to attempting long flights with low-powered engines, such a flight as from Melbourne to Sydney being quite unsuited for the 80-h.p. Le Rhône engine.

An All-Steel Avro for Australia.

It has been reported in *Sea, Land and Air* that the Australian Aircraft and Engineering Co., Ltd., of Sydney, have recently sold an all-steel Avro biplane, fitted with an 160-h.p. Beardmore engine, to Mr. Hogarth, of Richmond, N.Q. Mr. Hogarth's property is situated far from any workshop at which repairs could be effected, and believing that the extreme climatic conditions of the Northern State would be injurious to the woodwork of an ordinary machine, Mr. Hogarth decided in favour of an all-steel aeroplane

Presumably the steel construction is confined to the wings, as one has not heard of an "all-steel" Avro, although 504 Ks with fabric covered steel wings have long been an accomplished fact in this country for Service experimental purposes.

CANADA.

The Trans-Canada Flight.

After much hard work and more than the usual amount of bad luck, the trans-Canada flight has been accomplished. The start, from Montreal to Halifax, was fixed for Sept. 23rd, but an unfortunate mistake postponed the start for a fortnight. On shipping the Fairey seaplane from this country, a cable was sent to say that it had been shipped complete with engine. When the cases arrived in Montreal it was found that it had no engine!

After much delay occasioned by the above-mentioned incident and by bad weather, Col. R. Leckie, D.S.O., D.S.C., A.F.C., with Major B. Hobbs, D.S.O., D.S.C., as second pilot, Capt. Johnson as navigator, and an engineer, got away, making a non-stop flight to Fredericton for Halifax, the starting-point for the big flight.

Seventeen miles east of Fredericton they ran into very thick fog, which turned into sleet, gales, and snow, so that they landed, and were compelled to stand by the machine for three days as there was no shelter of any kind.

On endeavouring to start they had magneto trouble, which held them up a further 36 hours. They eventually got to Halifax and stayed a day there.

On Oct. 7th they started on the trans-Canada flight in the face of a forty-mile-an-hour wind. Crossing the Bay of Fundy, they met terrible weather, but made St. John, New Brunswick, with everything going well.

Just a mile or two past there the lower part of the engine cowling ripped off, cracking the front struts of the float undercarriage. They landed on Long Reach, making a good landing under the circumstances, but on pulling up the nose came down, so that the airscrew cut off the tips of the floats.

Col. Leckie immediately communicated with Halifax, and an H.S.2L was dispatched to pick them up.

They left Long Reach on the H.S.2L at dusk and made Rivière du Loup, landing about 11 o'clock at night with a six-foot sea running. Here an F.3, which had been erected as soon as the trouble with the Fairey was reported, was waiting for them.

They left early next morning, getting to Ottawa at noon.

They left again next morning, having been held up with magneto trouble, and made Sault Ste. Marie at night, being fogged there until dawn.

Next day they had fine weather as far as Kenora, but their flight from there up the Winnipeg River to Lake Winnipeg and down the Red Deer River to Selkirk was made in bad weather and must have taxed the crew, who had been up day and night for three weeks, to their utmost.

The machine was placed under a guard at Selkirk, it having been found impossible to get to Winnipeg on the F.3 owing to the weather, and the bag of mail was transferred by road to the land machine, a D.H.9a (400-h.p. "Liberty"), which was waiting for them at Winnipeg.

This machine, piloted by Capt. C. W. Thompson, with Commodore Tylee as observer, made Calgary in good time, where it was hung up by fog in the mountains.

The first fall of snow made many prophesy that the machine would be weatherbound for some time, but the weather cleared enough next day to enable them to get away at mid-day to Revelstoke, then on to Merritt, B.C., where they were again held up by fog and snow, and finally on to Vancouver, which was reached on Sunday, Oct. 14th.

The last 60 miles from Agassiz to Minoru Park, Vancouver, took 35 min.

On arrival there the machine was met by the Mayor of Vancouver, Mr. H. O. Bell-Irving, chairman of the British Columbia executive of the Canadian Air Board, and Col. Leckie, the pilot from Halifax to Winnipeg.

Route Mapping.

The Flying Operations Group of the Canadian Air Board are carrying out surveys to different points within the Dominion in order to collect records, observations, aerial photographs, and data with a view to the establishment of commercial air routes throughout Canada.

In connection with this scheme, two H.S.-2L (2-330-h.p. U.S. Naval pattern low-compression Liberty engines), piloted by Lieut.-Col. R. Leckie, D.S.O., D.S.C., D.F.C., and Capt. Allan Wilson respectively, flew from Halifax to Roberval, Lake St. John, Quebec, on July 17th, 1920, a total distance of 612 miles, in 10 hr. 13 min. flying time.

The air route, *via* Halifax, Windsor, Scots Bay, Isle Haute, St. John's, Fredericton, Woodstock, Grand Falls, Lake Temiscouta, Frazerville, Tadousac, and Roberval, was as the result of the survey found to be quite useful for commercial purposes. It was recommended that in licensing seaplane bases it should be made compulsory for the licensee to provide moorings, a second requirement being that a barge or scow should be provided for refuelling purposes.

It was stated that the weather reports furnished by the Meteorological Office were found to be extremely useful and absolutely correct. As the result of being in possession of those reports, the Operations Group were able to choose the only two good days clear of fog out of a period of 21 days to make the flight. It was strongly recommended that early efforts should be made to increase the meteorological reports.

Aerial Forestry.

A recent expedition carried out by the Canadian Air Board to Lake Timiskaming was an unqualified success, and as a result forestry experts and entomologists are loud in their praise of the possibilities and future of aviation. Col. Leckie flew some specialists up the Ottawa River to North Bay and then on to Haileybury.

On approaching the latter spot the entomologist suddenly began to gesticulate wildly and the pilot thought for a moment that he was taking leave of his senses. It appeared, however, that he had spotted the "spruce bud worm" disease from the air.

The forester said that in eight hours' flying he had been able to sketch in, from the air, on his map the complete details of the forest in forty-two townships, showing the different types of growth, burned over, cut and diseased areas, etc., a work which could not have been done by many parties in a single season.

NEWFOUNDLAND.

Seal Hunting by Airship.

Four airships, three S.S. "Zeros" (1-75 h.p. Rolls-Royce "Hawk") and one S.S. "Twin" (2-75 h.p. Rolls-Royce "Hawks"), presented to the Newfoundland Government by the Air Ministry, left the Thames on Oct. 29th *en route* for Newfoundland per S.S. *Alconda*. These four ships, with all necessary equipment and ample spares, will form the nucleus of a regular Government air patrol service, and after an experiment in seal hunting they will be used as a matter of routine in survey work and forest patrol.

In all probability, two airships will be employed in the seal-locating test, which will be made early next year. In order to intercept the herds of young seals that, immediately after the breeding season, drift down on the ice, the airships will fly over the North Atlantic and, by means of wireless, communicate the exact positions of the various herds to the sealing fleet.

Mr. F. J. Tippen, consulting airship engineer and constructor to the Newfoundland Government, is in charge of the expedition.

NEW ZEALAND.

A correspondent of The Aeroplane in New Zealand writes :—

A Pioneer New Zealand Flight.

On Aug. 26th Capt. Euan Dickson, D.S.C., D.F.C., of the staff of the Canterbury Aviation Co., flew from Sockburn Aerodrome to Trentham, Wellington. This is the first flight that has been made across Cook Strait, between the North and South Islands of New Zealand.

Capt. Dickson left Sockburn at 7 a.m. in an Avro biplane (110-h.p. Le Rhone), with Mr. C. H. Hewlett (deputy chairmon of the Canterbury Aviation Co.) and Mr. J. E. Moore (the company's chief mechanic) as passengers.

The return trip was made on Aug. 28th, Capt. Dickson spending several days at Blenheim, where he made numerous passenger flights. He so impressed the citizens of Marlborough that there has been some talk of forming a company to build an aerodrome.

The following table compares the time taken by Capt. Dickson on the return and outward trips :

	Out.		Home.	
	hr.	min.	hr.	min.
Christchurch-Kaikoura	1	55	1	55
Kaikoura-Blenheim	1	30	1	9
Blenheim-Trentham	1	15	1	5
	4	40	4	9

On arrival at Wellington large crowds watched the Avro's flight over the city. Parliament was just assembling and the legislators crowded out to see the aeroplane go on its way towards Trentham. Later, reference was made in the House to the flight and its importance was stressed. Many members of Parliament congratulated Capt. Dickson on the success of his venture.

The bad weather which preceded and followed Capt. Dickson's flight showed that he only just slipped across between two bad weather disturbances. As a matter of fact, he was warned by the Government meteorologist that it would be unsafe to make the flight at all.

At Blenheim and Kaikoura Capt. Dickson took up 250 passengers for joy-rides and dropped copies of "Marlborough the Golden."

Capt. Dickson carried a small aerial mail each way and his progress was reported throughout by the various telegraph offices.

Auckland to Wellington.

Capt. R. Russell, who recently flew from Auckland to Wellington, furnishes the following account of his flight : "From Tokomaru Bay the coastline was followed at an average height of 3,000 ft. until Tologa Bay was reached, where a circuit was made, the journey being continued on to the Gisborne racecourse, where a good landing was effected. With a following wind this stage of about 65 miles occupied 40 min. Whilst attempting a non-stop flight from Gisborne to Hastings the engine petered out. The machine was at this time about 4,500 ft. up, and luckily just over practically the only landing-ground between Gisborne and Napier. On landing it was found that the contact-breaker had become stuck, and by the time the machine was ready it was decided to wait until the next morning before resuming the flight.

"Next morning a fresh start was made and in half an hour Hastings was reached. Here about 8,000 spectators witnessed the arrival of the aeroplane. When taking off at Hastings the engine cut out owing to the inferior quality of the petrol used, and a forced landing was made in a three-quarter acre paddock, with the result that one of the wings was badly damaged. A new wing was shipped from Auckland and when it had been fitted the flight was resumed. The distance of 60 miles to Dannevirke was covered in 58 min. at an average height of 4,500 ft. A bank of clouds obscured the town of Dannevirke, but on gliding down the racecourse could be seen and here a good landing was made. After changing two valves at Dannevirke the flight was continued to Palmerston North, the flight of 40 miles taking 35 min. The average height during this stage of the flight was 5,000 ft., but when crossing the Ruahine Mountains at the Manawatu Gorge it was necessary to get up a bit higher. The last stage of the journey, about 140 miles ground distance, occupied 2¼ hours."

A Sound Policy.

Within the past few months the Government has sent a number of machines to a new aerial company at Timaru. This company proposes to establish passenger and mail services between Timaru, Dunedin and Invercargill, and between Timaru and Mount Cook. It is understood that the aeroplanes were sent down to the syndicate on the advice of the Air Board. This body believes, quite rightly, that the machines presented by the British Government should be, if possible, in use and not merely stored pending the announcement of a definite air policy by the Government.

The Air Board's policy has been severely criticised by several parties. It is alleged that the aeroplanes sent to the Timaru company have been in the nature of a free gift. Mr. Hewlett, deputy chairman of the Canterbury Aviation Co., has protested on behalf of his company against the Air Board's action. He is of the opinion that the creation of another company within a hundred miles of the Canterbury Aviation Co., and operating within that radius, will kill aviation, and that both companies will be forced to curtail their activities absolutely. [Competition is the life of trade. —Ed.]

The position at present is not at all clear. Mr. Hewlett states that the leading promoter of the new company interviewed him at the beginning of the year to see if the Canterbury Aviation Co. would be prepared to join him in the formation of the new company or run it in conjunction with him. The Canterbury Aviation Co. turned the proposition down and since then the company has been formed independently of them.

It has been stated in the House that the aeroplanes have not been given or even loaned to the new company. The Minister of Defence (Sir Heaton Rhodes) said that the machines had been sent on to Timaru because if they had been unloaded at Sockburn they could not have been loaded again. The new company had asked that this should be done pending an agreement between the syndicate and the Air Board, the company, of course, bearing all costs and taking all risks.—H. B.

The New Secretary.

Capt. T. M. Wilkes, M.C., N.Z.S.C., has been appointed secretary to the New Zealand Air Board in place of Lieut.-Col. Sleeman, who has been acting secretary.

A High Cross-Country Flight.

On Sept. 8th Capt. Wilkes and Capt. Isitt, in a Bristol fighter, flew from Washdyke to Mount Cook and back, passing over the tail of the Tasman glacier and down the Hooker to the Hermitage.

The whole trip occupied 95 min., the outward run, against a strong north-west gale, occupying 68 min., the home run being made in 27 min. The flight over the Southern Alps was made at a height of 14,000 ft. The two aviators have been surveying the southern aerial routes for the Air Board.—H. B.

SOUTH AFRICA.

Whale-Spotting from the Air.

Major Honnet, of Air Flights, Ltd., has recently returned from England to East London with three Avros, which he has assembled in conjunction with Mr. Basil Runnert of the same company. Major Honnert hopes to be able to interest whaling companies in the use of aircraft for whale-spotting.

Filming the Victoria Falls from the Air.

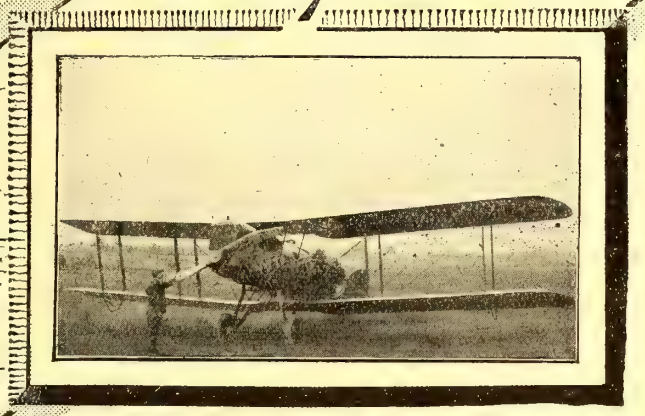
Messrs. Rutherford and English have been filming the Victoria Falls from their Avro biplane "Rhodesia." In spite of the difficulties of the task, principally due to the dense bush, emergency landing-grounds being absolutely non-existant, the falls were successfully "shot," which tends to prove that practical commercial flying in Rhodesia is a sound proposition.

Aeronautical Propaganda.

Capt. Hemming, D.F.C., and Messrs. Frank and Shirley Solomon, of Aviation, Ltd., are now engaged in an extended tour of the country districts north of Cape Town, extending to Namaqualand, the following places being among the many to be visited : Caledon, Wellington, Paarl, Moorrelsburg, Piquetburg, Van Rhyn's Dorp, Clan William, Ceres, Tulbagh, Porterville, Darling, Vredenburg, and E pefield.

The continued success experienced by Aviation, Ltd., and the amount of good work they are doing in giving straightforward exhibition and passenger flying, accounts largely for the rapidly growing confidence that the South African people are placing in aviation .

The "Bristol" Aeroplanes



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OFFICIAL NOTICES.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

NOVEMBER 8th:

A.T.T., DH9, G-EAPL, London-Paris, 09.45-13.10, G.&M., Nil, Duke.
A.T.T., DH16, G-EASW, London-Paris, 13.15-15.20, G.&M., 2, Armstrong.
A.T.T., DH9, G-EAQN, London-Paris, 13.40-15.55, Nil, 2, Robins.
M.A., Breguet, F-CMAF, London-Paris, 13.45-16.20, Nil, 1, Le Men.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 14.00-16.18, G.&M., 2 Van Opstal.
A.T.T., DH9, G-EAQL, Paris-London, 10.15-12.43, 2, Carter.
A.T.T., DH9, G-EAOZ, Paris-London, —11.28, Nil, Nil, Reeves.
S.N.E.T.A., DH4, O-BADO, Brussels-London, —12.35, Nil, Nil, Van Opstal.
C.T., Nieuport, F-ICGT, Paris-London, 12.30-15.15, M., Nil, Lasnes.
A.T.T., DH18, G-EAUF, Paris-London, 13.15-15.40, G., 4, Holmes.
S.N.E.T.A., DH4, O-BABI, Brussels-London, 11.50-14.15, M., Nil, Briere.

NOVEMBER 9th:

A.T.T., DH9, G-EAQP, London-St. Inglevert, 09.48-16.55, G.&M., Nil, Tebbit.
C.T., Nieuport, F-ICGT, London-Paris, 12.20-15.15, Nil, Nil, Lasnes.
C.T., Nieuport, F-CGTO, London-Paris, 12.20-14.00, Nil, Nil, Mauler.
A.T.T., DH16, G-EALU, London-Paris, 13.05-16.00, G.&M., 1, Lines.
S.N.E.T.A., DH4, O-BABI, London-Brussels, 14.00-16.15, G.&M., Nil, Briere.
A.T.T., DH9, G-EAPL, Paris-London, 10.00-12.33, G., 1, Duke.
M.A., Breguet, F-CMAB, Paris-London, 12.45-15.23, G.&M, Nil, Le Sec.
A.T.T., DH16, G-EASW, Paris-London, 13.15-15.35, G., 2, Armstrong.

NOVEMBER 10th:

I.A.L., "Bat," G-EAPK, London-St. Inglevert, 09.10—, Nil, 1, Chattaway.
A.T.T., DH9, G-EAQL, London-Paris, 09.52-12.05, G.&M., Nil, Carter.
A.T.T., DH9, G-EAOZ, London-St. Inglevert, 12.56—, Nil, 1, Reeves.
A.T.T., DH16, G-EALM, London-Paris, 13.10-15.25, G.&M., 3, Armstrong.
M.A., Breguet, F-CMAB, London-Paris, 13.52-16.10, G., 1, Le Sec.
A.T.T., DH9, G-EAQP, St. Inglevert-London, —12.50, G., Nil, Tebbit.
I.A.L., "Bat," G-EAPK, St. Inglevert-London, 12.50-14.06, G., 1, Chattaway.
G.E.A., "Goliath," F-GEAD, Paris-London, 12.00-15.10, G., 4, Labouchere & 1.
A.T.T., DH9, G-EAOZ, St. Inglevert-London, —15.22, Nil, Nil, Reeves.
A.T.T., DH16, G-EALU, Paris-London, 13.20-15.22, G., 1, Robins.
A.T.T., DH9, G-EAQL, Paris-London, 14.25-16.27, Nil, 1, Lines.

NOVEMBER 11th:

A.T.T., DH9, G-EAQP, London-St. Inglevert, 09.35—, G.&M., 1, Duke.
G.E.A., "Goliath," F-GEAD, London-Le Crotoy, 10.45—, Nil, Nil, Labouchere & 1.
A.T.T., DH16, G-EASW, London-St. Inglevert, 13.30-14.35, Nil, 4, Holmes.
A.T.T., DH16, G1EASW, St. Inglevert-London, —16.05, Nil, 1, Holmes.
G.E.A., "Goliath," F-GEAD, Le Crotoy-London, —16.13, G., Nil, Labouchere and 1.

NOVEMBER 12th:

A.T.T., DH9, G-EAQL, London-Paris, 09.57, discontinued flight, G.&M., Nil, Bamber.
G.E.A., "Goliath," F-GEAD, London-Paris, 12.53-15.45, G., Nil, Labouchere & 1.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 12.00-15.05, M., Nil, Delzenne.

NOVEMBER 13th:

S.N.E.T.A., DH4, O-BARI, London-Brussels, 13.46-10.55/14th, M., 1, Delzenne.

NOVEMBER 14th:

NIL.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

NOVEMBER 8th:

H.P.T., HP, G-EAMA, Brussels-London, 13.16-15.23, Nil, 1, Olley & 1.
H.P.T., DH9, G-EAUC, Paris-London, 12.45-15.33, Nil, 2, McIntosh.

NOVEMBER 9th:

H.P.T., HP, G-EAMA, London-Paris, 11.40-14.45, G., 5, Beal & 1.
H.P.T., DH9, G-EAUN, Brussels-London, 12.00-14.12, G.&M., 1, Hope.
H.P.T., HP, G-EASL, Paris-London, 12.36-16.36, G., 6, Bager & 1.

NOVEMBER 10th:

H.P.T., DH9, G-EAUN, London-Paris, 11.57, landed 10 miles from Paris, arr. Paris 12.30 (11th), Nil, 2, Hope.
H.P.T., DH9, G-EAUI, London-Brussels, 12.45-14.50, G.&M., Nil, Jones.
S.N.E.T.A., DH9, O-BIEN, Brussels-London, 11.55-15.10, M., 2, Wouters.
H.P.T., HP, G-EAMA, Paris-London, 13.00-16.45, G., 3, Beal & 1.

NOVEMBER 11th:

H.P.T., HP, G-EATG, London-Paris, 11.55, landed St. Inglevert 14.30, G., 7, Fowler & 1.
S.N.E.T.A., DH9, O-BIEN, London-Brussels, 12.42, landed Lympne 13.12, G.&M., Nil, Wouters.

NOVEMBER 12th:

H.P.T., HP, G-EASY, London-Paris, 12.25, landed Noailles, arr. Paris 14.50 (13th), G., 8, Olley & 1.
H.P.T., DH4a, G-EAVL, London-Brussels, 12.45-15.00, G.&M., Nil, Helliwell
H.P.T., DH9, G-EAUI, Brussels-London, 11.55-14.40, Nil, Nil, Jones.

NOVEMBER 13th:

NIL.

NOVEMBER 14th:

H.P.T., HP, G-EASL, London-Paris, 12.00—, G. 2, Bager & 1.
H.P.T., DH4a, G-EAVL, Brussels-London, 11.55 (13th), landed St. Inglevert, 13.30, G.&M., 2, Helliwell.

Air Port Statistics.

Owing to heavy rains, mists and fogs prevailing during the past week, the air lines to the Continent have been badly hampered, but not to so great an extent as the ground transport services.

CONTINENTAL

MACHINES:			
	Croydon 36	Cricklewood 16	Total 52
PERSONNEL.—Passengers:			
	Croydon 37	Cricklewood 42	Total 79
Crews:			
	Croydon 40	Cricklewood 23	Total 63

INLAND.

MACHINES:			
	Croydon 39	Cricklewood 16	Total 55
PERSONNEL (including one member of Crew per machine):			
	Croydon 311	Cricklewood 35	Total 346

Grand Total Machines 107. Grand Total Personnel 488.

Inland Flying at Croydon.

Nov. 8th.—A.T.T., DH9 from Biggin Hill (Reeves); "Kangaroo" from Hendon (Kenworthy); M.W.H.C., 1 test, DH6 (Lovell).
Nov. 9th.—A.T.T., DH16, 1 test (Lines).
Nov. 10th.—A.T.T., DH16, 2 tests (Duke); "Kangaroo," 1 test (Kenworthy); M.W.T.C., DH6, 3 tests (Lovell).
Nov. 11th.—M.W.T.C., DH6, 1 test (Lovell).
Nov. 12th.—M.W.T.C., DH6, 1 test (Lovell); G.E.A., "Goliath," 1 test (Labouchere).
Nov. 13th.—I.A.L., "Vimy," 6 joy-rides, 66 passengers (Chattaway); A.T.T., DH16, 1 test (Reeves)
Nov. 14th.—W. Beardmore and Co., W.B.2, Cricklewood return (Ward); I.A.L., "Vimy," 18 joy-rides, 187 passengers (Chattaway).

Inland Flying at Cricklewood.

Nov. 8th.—H.P.T., DH9 from Wembley (Helliwell).
Nov. 9th.—H.P.T., BE2e 2 tests (Jones); 4 tests (Gladstone).
Nov. 10th.—Nil.
Nov. 11th.—H.P.T., DH9, test (Olley); O/400 test (Brackley); DH4a test (Olley).
Nov. 12th.—H.P.T., BE2e test (Brackley).
Nov. 13th.—Sopwith "Pup" from Castle Bromwich (Perry); DH9 test (Jones); DH9 test (Brackley).
Nov. 14th.—W.B.2 to Croydon return (Ward).

Reprinted from "The Times," of Oct. 12th, 1920.

TO BUKARES AND BACK.

BUSINESS MAN'S FLIGHT OF 3,250 MILES.

Mr. Reginald Wright, managing director of a Lancashire firm of locomotive engineers, arrived at Cricklewood Aerodrome yesterday on his return from a business visit to Rumania, having made the journey both ways by aeroplane, a distance in all of 3,250 miles. The last stage of the journey was a non-stop flight of 420 miles from Strasburg to London, accomplished in 3 hours 50 minutes, and the average flying speed for the whole journey from Jassy to Cricklewood was just over 100 miles per hour.

Having urgent business in Bukarest, Mr. Wright hired the aeroplane, a Handley Page with a Siddeley "Puma" engine of 230 h.p., and, piloted by Mr. H. H. Perry, formerly of the R.A.F., left London on September 12th, by way of Prussels, Nuremberg, Vienna, and Belgrade. They reached Bukarest on September 16th, but at Belgrade, where the pilot had to land on a military parade ground, they were detained two and a half days by the authorities on suspicion of being Bolshevist envoys, and were only allowed to proceed through the good offices of the British Charge d'Affaires. Mr Wright used the machine also for travelling about Rumania. It enabled him, for instance, to visit Jassy, 215 miles away, and return to Bukarest in the day, whereas in the present state of the Rumanian railways the journey by rail would have taken 20 hours each way.

Mr. Wright and his pilot left Bukarest last Saturday, spent the night in Vienna, continued on Sunday to Strasburg, 415 miles, in one flight, and yesterday morning completed the journey of 1,635 miles in 16 hours 5 minutes actual flying time.

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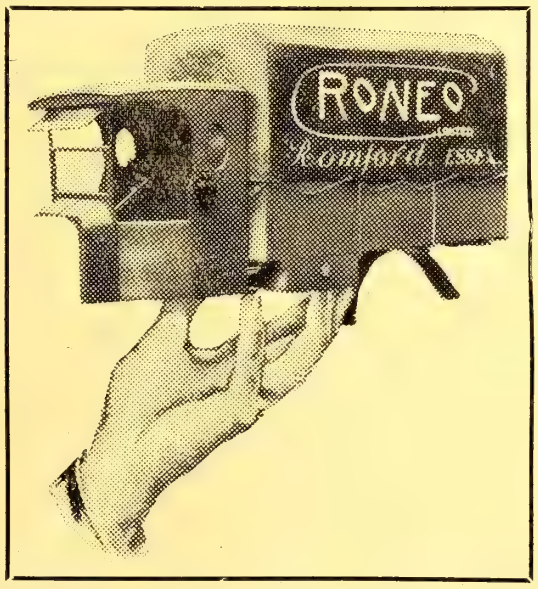

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The London Terminal Aerodrome.

One stated last week that the Air Post of Banks was starting again shortly under a new name This statement appears to be totally untrue. The line will, it is hoped, carry on as before under the present name.

The great question of the week at Croydon has been to solve the mystery of the cat that flies through glass windows. It is said that this curious phenomenon is unique.

During the week-end a very severe bump was disturbing the air of Croydon above the Customs House. One was informed by a pilot that this was due to heat rising from certain literature. The Customs at Croydon have now been raised to an extraordinary pitch of efficiency. This is due to the efforts of Mr. Knight and his staff, who do their work in a quiet way, getting everything through with maximum celerity and minimum "hot air."

Aircraft Transport and Travel, Ltd., have cut out the 09.30 service and are increasing the 12.30 one accordingly. This is only for the few winter months and in the spring the old service will be restored, together with additional machines. Special machines can still be obtained, and reasonable notice should be given when possible.

On Wednesday, Mr. Kenworthy, who arrived on Monday with the Blackburn Kangaroo, was demonstrating the machine to directors of the Instone Air Line. The machine gets off well and handles well in the air for a machine of this size. Taking off from the far side of the aerodrome against a wind of not more than 10 m.p.h., she passed over the offices at a height of about 500 ft., and executed several banks of 45 deg. and landed again very slowly. She had several passengers up.

On Saturday the "Vimy" was again doing "5s. joy-rides," 65 passengers having flights in the intervals between showers. Mr. North, a member of the aerodrome staff, did invaluable work as χωρος, both with and without a megaphone, in getting passengers.

On Sunday all previous records were eclipsed. People came from all round, and one enterprising *char-à-bancs* appeared. Intending passengers were formed into a queue and Mr. Chattaway was up and down continuously from mid-day until dusk with a short interval for lunch.

Prominent among the passengers were boys from surrounding public schools, notably from Dulwich College. When it became too dark for further flying there were still some 50 people waiting for a flight. A total of 187 passengers were carried on Sunday and 65 on Saturday, making a total of 252 for the week-end. The weather was distinctly unfavourable.

It seems that there is plenty of scope for more machines going in for this excellent form of propaganda; given a fine day the I.A.L. will have far more passengers than they can manage.

M. Boudré, who looks after the interests of the Compagnie des Grands Express Aeriens, informs one that on one day last week a "Goliath" was the only machine to get through from Le Bourget to Croydon. Two machines of this type made the journey on that day, one in each direction Congratulations to the pilots of these steady-going machines

There are persistent rumours of another air line operating from Croydon shortly.

Capt. Ward and Mr. Beard flew over to Croydon from Cricklewood in the W.B.2 (G-EARX) on Sunday, and returned again after lunching at the Trust House.—G. D.

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

The paper on "The Problems of the Helicopter," by M. Louis Damblanc, will commence at 5 p.m. on Thursday, Nov. 18th, at the Royal Society of Arts, John Street, Adelphi, when Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., will be in the chair.

Air Marshal Sir Hugh Trenchard, K.C.B., D.S.O., will take the chair at the following meeting at 5.30 p.m. on Thursday, Dec. 2nd. Two papers will be read, "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C., and "Airship Mooring," by Flight-Lieutenant F. L. C. Butcher, R.A.F.

SCOTTISH BRANCH.

Air Commodore Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., will lecture on "Lines of Future Progress in Aeronautical Research," on Thursday, Nov. 18th, at the Engineers' Institute, Glasgow. Brigadier-General J. G. Weir, C.M.G., F.R.Ae.S., will take the chair.

Mr. J. L. Bartlett will read a paper on "Airships: General Principles," on Monday, Nov. 22nd, and on "Rigid Airships: Design and Materials," on Tuesday, Nov. 23rd. Both lectures will take place at 7.45 in the Engineering Class Room at Glasgow University.

EXAMINATIONS' COMMITTEE.

A meeting of this Committee was held on Nov. 11th, when Dr. L. Bairstow (Chairman), Wing Commander Cave-Browne-Cave, and Dr R Mullineux Walmsley were present. Draft regulations for the examinations prepared by the Chairman were discussed and approved with certain slight modifications, and will be brought before Council at the next meeting.

LIBRARY.

The following books have been received and placed in the Library: "Dynamics of the Aeroplane," by Rene Devilliers, and "The Complete Airman," by G. C. Bailey, D.S.O.

Nov. 12th, 1920. W. LOCKWOOD MARSH, Secretary.

THE R.A.F. MEMORIAL FUND.

A Meeting of the Executive Committee was held at 7, Iddesleigh House, Caxton Street, S.W 1, on Thursday, November 4th, Lord Hugh Cecil in the Chair. There was a full attendance of Members of the Committee, amongst whom were Dame Helen Gwynne-Vaughan, Mrs. Barrington Kennett, A.V.M. Sir John Salmond, A.V.M. A. V. Vyvyan, Air Commodore Brooke-Popham, Air Commodore C. A. H. Longcroft, F. E. Rosher, Esq., and W. S. Field, Esq.

A list of donations and subscriptions to the Fund since the last Meeting on October 20th, was presented, and is set forth at the end of this statement.

A Scheme for establishing a Boys' Home for the Sons of Airmen, at Vanbrugh Castle, Blackheath, was again considered, and the recommendations of the sub-committee, of which A.V.M Sir John Salmond is Chairman, were agreed to, and it was decided to make every effort to be in a position to open the Home shortly after Easter, 1921.

The R.A.F. Memorial, which is one of the chief objects of the Fund, again came up for discussion, and a letter was read by the Chairman from the Dean of Westminster, regarding the possible site near St. Margaret's Church and Westminster Abbey, but the Dean was unable to make any specific promises in the matter until he had consulted the Chapter, and the matter was left over for future discussion.

It has been decided to open a campaign for raising funds in the provinces, and this will probably be inaugurated early in the New Year by visits being paid to Manchester, Liverpool, and certain large towns in Yorkshire. It is hoped that Lord Hugh Cecil and other prominent Members on the list of Vice Presidents, or Members of the Executive Committee, especially those connected with the North, will speak at these meetings.

With regard to the co-operation of the Fund with existing organisations, as set forth in the previous meetings proceedings, all matters are being very satisfactorily adjusted, in such a manner that there will be no overlapping as between this Fund and existing Associations and Societies.

It was decided to ask Lady Trenchard, wife of the Chief of the Air Staff, to become a Member of the Executive Committee.

The next Meeting of the Committee is fixed for Thursday, 25th inst., at 3 p.m., at the Offices of the Fund

Amount of donations and subscriptions announced up to October 19th, 1920 ..... £101,125 4 9

Amount since received up to November 3rd, 1920 ..... 882 4 7

Total £102,007 9 4

PERSONAL NOTICES.

DEATHS.

BOCKETT-PUGH.—Flying Officer Henry Charles Edward Bockett-Pugh, D.F.C., R.A.F., who was killed in action near Samawah, Mesopotamia, on Sept. 22nd, was the elder son of Major E. H. Bockett-Pugh, late R.M.L.I., and Mrs. Bockett-Pugh, and grandson of Mrs. Charles Paul. He was 21 years of age.

DREW.—Capt. Jack Drew, R.A.F., late 7th Cameron Highlanders, who died on Sept. 21st at the R.A.F. Hospital, Finchley, was the husband of Augusta Drew, 158, Sternhold Avenue, Streatham Hill, S.W. He was 33 years of age.

HALSTED.—Flt. Lieut. Francis Neville Halsted, D.S.C., D.F.C., R.A.F., only son of Mrs. Halsted, Edenholme, Reigate, was drowned at sea, off Constantinople, on Oct. 3rd.

SWINTON.—At Bombay, in September, Arthur J. Swinton, Captain, late Royal Engineers.

Arthur Swinton was well known to the readers of this paper as the author of the "A. B. C. of Flying," the first work which dealt seriously with the financial side of Commercial Aviation. His latest work, "The Aeroplane Handbook," which he compiled and edited as a book of reference, appeared just at the time of his death.

He served in the South African War and later was stationed in Mauritius. His foreign service resulted in his contracting fever and dysentery, from which latter disease he died. At the outbreak of the present (or perhaps one may now say past) war he rejoined his regiment, but was invalided out after a short period of service.

After the war he conceived the idea of compiling a Register of Pilots, which he intended should ultimately develop into a kind of "Lloyd's Register," and was to include ultimately machines as well as pilots. Unfortunately the idea was premature, and the Register was not a success, though it was certainly not a failure. Those who registered their names merely lost the registration fee of a guinea; Arthur Swinton lost many hundreds of pounds.

It was an effort to retrieve his fortunes which took him to Bombay, and there is real tragedy in the fact that the business on which he went there had just gone through satisfactorily when he died.

Arthur Swinton was a man for whom one easily acquired a liking. His charming casual manner and his apparently flippant humour, which made him a most amusing companion, merely camouflaged a very keen and businesslike mind. His consistently bad health prevented him from carrying through the various clever schemes which he produced, and, apparently by way of revenge for the defeat of Fate, death took him just when he had apparently won through and made good.—C. G. G.

COMING EVENTS.

NOVEMBER.

18th, Thurs.—R.Ae.S. lecture. "The Problem of the Helicopter," by M. Louis Damblanc, at Royal Society of Arts, at 5 p.m.

20th, Sat.—No. 8 Naval Sqd. Dinner at Holborn Restaurant at 18.45. Particulars from Sqd. Ldr. Bromet, H2, Coastal Area, 33, Tavistock Place, W.C.1.

DECEMBER.

1st, Wed.—Westgate-on-Sea Seaplane Base and R.A.F. Manston Dinner at Holborn Restaurant. Particulars from Mr. T. S. Setterfield, 1, Cuthbert Road, Westgate-on-Sea.

2nd, Thurs.—R.Ae.S lecture. "Airship Mooring," by Flight Lt. F. L. C. Butcher, and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.*

11th, Sat.—Armament School, Uxbridge. Dinner at Holborn Restaurant at 7.15 Hon. Sec. at 32, Old Jewry, E.C.

16th, Thurs.—R.Ae.S lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Installation of Aeroplane Engines," by A. T Rowledge.*

18th, Sat.—Felixstowe Air Station Reunion Dinner at the Connaught Rooms, W.C.2, at 7 p.m. Particulars from Mr. W. Kitson, 22, Manor Terrace, Felixstowe.

JANUARY—1921

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr H. W. S. Outram.*

17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m.

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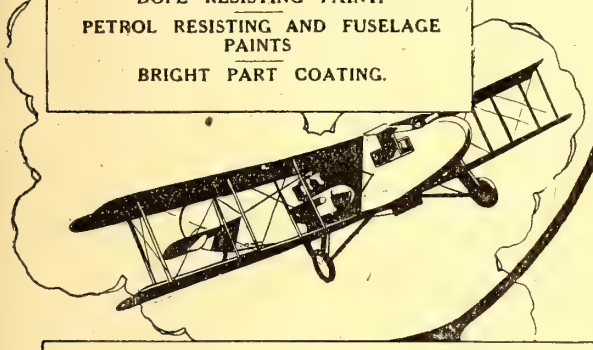

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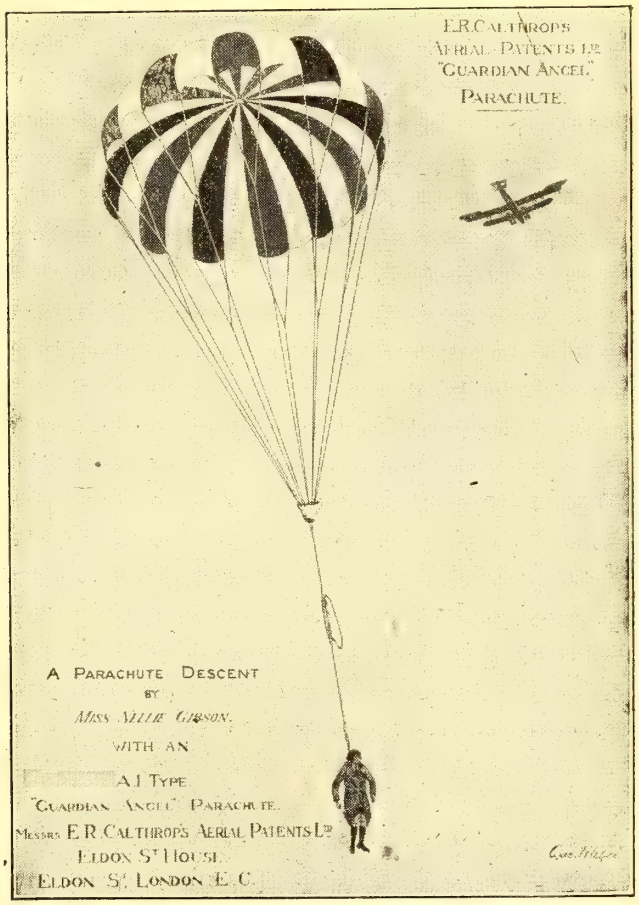

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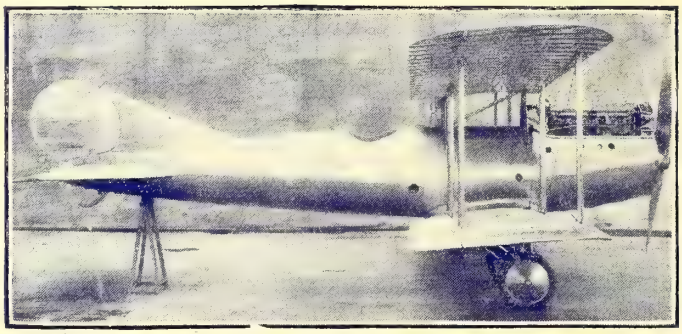

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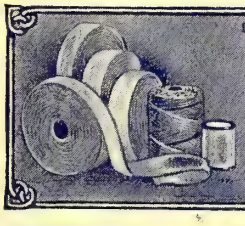

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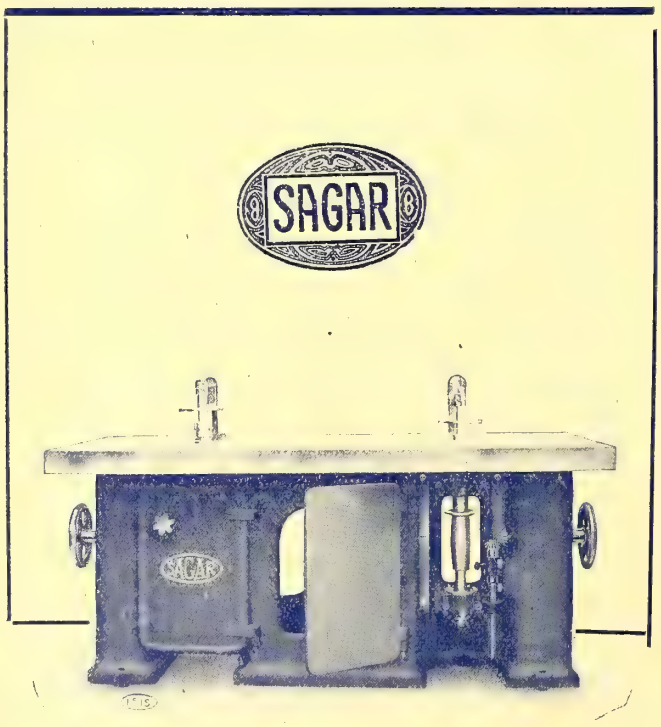

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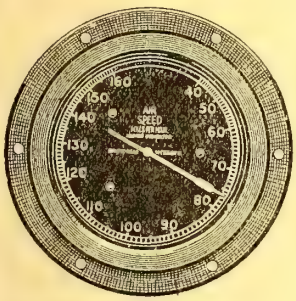

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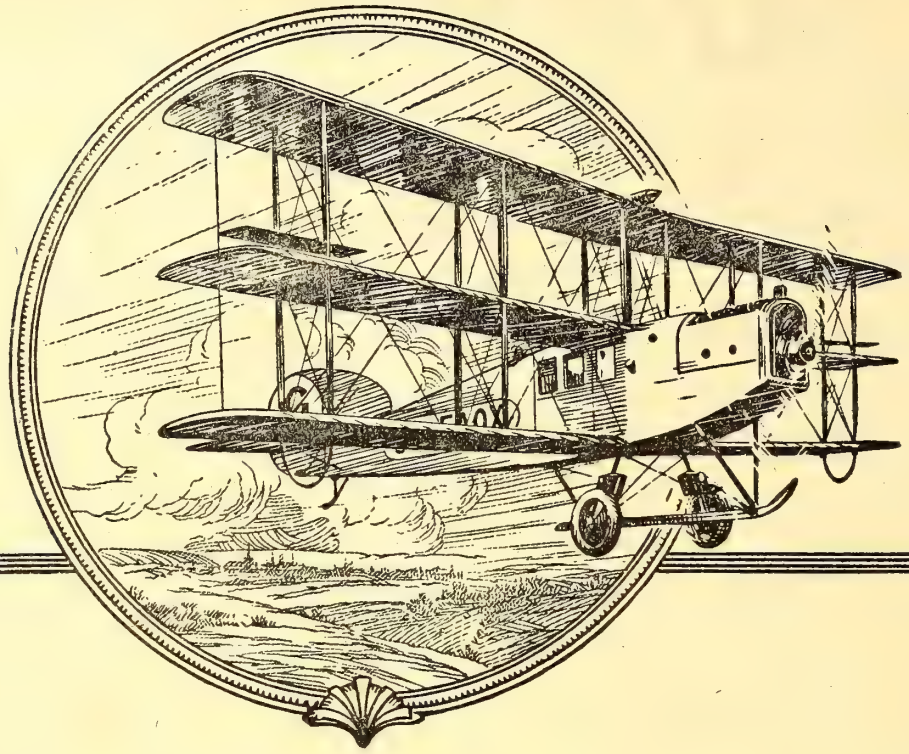

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ON THE NEEDS OF CIVIL AVIATION.—VI.

The Royal Aeronautical Society's Opportunity.

Truly, we are a comic people, and never so comic as when we are most serious. On Wednesday last, Nov. 17th, the Royal Aeronautical Society held its annual dinner, quite a good dinner, but for the fact that one had to climb many stairs to reach it, and afterwards had to fight through a mob of well-dined Freemasons and their amazing womenfolk (equally thus) in order to retrieve one's hat and coat.

Be that as it may, the rest of the proceedings were quite enjoyable, except for a portion of an entirely undesired programme of alleged music (the party broke up before all of it had been inflicted) in which a gentleman with a good chorus voice resonated that hackneyed aria, "She alone charmeth my sadness," from *La Reine de Saba*; a young lady with a violin that sounded like a rasp on a horseshoe demonstrated unintentionally how Johann Sebastian Bach can be turned into a two-step; and a not-so-young lady who reached, *à la môde de Tooting*, with varying success for those rather tricky high notes in Edward German's "Love, the Pedlar." But that also did not matter much, except that people who meet at an annual dinner, many of them from afar off, would much rather wander from table to table and talk to one another than sit and endure silently even good music. After-dinner music, like cards and billiards and such post-prandial penances, was only intended for people who are devoid of the brains with which to carry on a conversation. The members of the Royal Aeronautical Society, *ipso facto*, possess brains, so perhaps the Committee will remember the fact next year.

The Need for Publicity.

Apart from the pleasure of meeting so many old friends, the charm of the evening was in the speeches. The Marquess of Londonderry, the guest of the evening, as debonair as usual, in proposing the toast of the Society assured the Society of the Government's sympathy with aviation and its intention to help aeronautical progress as much as possible. Because Lord Londonderry happens to be Lord Londonderry and not a politician, one believes him. He may be let down by Mr. Lloyd George, as so many others have been, but at any rate he is speaking the truth as he sees it, and so long as he remains in office aviation has a powerful friend at Westminster.

The Lord Weir of Eastwood, President of the Council of the Society, replied in one of those wonderful speeches of his which combine the wisdom of the Book of Proverbs with the wit of "Wee McGregor." He said that what aviation wanted was publicity of the right sort. The Air Conference was an excellent idea, and it achieved publicity, but, as might have been expected, the newspapers were more interested in "hundred passenger aeroplanes" and in the proposition to build an aerodrome over the top of Victoria Station than in the solid progress that was being made. He tactfully avoided including steam turbines in the list of apochryphally progressive products. He advised speakers at the next Conference to avoid mentioning anything which might excite the Press.

Lord Weir's Wit and Wisdom.

The best jest and the best bit of philosophy of the evening was Lord Weir's story apropos people who say that aviation is dead, or a lost cause. "They remind me," said he, "of the reply of the schoolboy who was asked where the elephant is most commonly found. His answer was, 'On account of its large size the elephant is very seldom lost.'"

That is perhaps the most consoling possible thought for those who love aviation, but fear that it is indeed lost. Such people only fear such a thing because they do not keep sufficiently closely in touch with what is actually doing under the surface.

Another excellent remark of Lord Weir's referred to those who say that there is nothing doing in aviation, and that aviation has little to show for the money it is spending. Lord Weir said that the reply to such was that of Becky Sharp: "Any woman can be respectable on an adequate income." As a matter of fact, one recommends people who think that there is nothing doing in aviation to read the "Arrivals and Departures" tables from the London aerodromes.

Lord Weir referred to the active branch of the R.Ae.S. at Cambridge and to the increasing interest which Scotland is taking in aviation, as instanced by the number of members of the flourishing Scottish Branch of the Royal Aeronautical Society. This, incidentally, includes about ninety pilots, in addition to some hundreds of other members, and has a number of machines of its own at the Renfrew Aerodrome, where mechanics are supplied by the Beardmore works. He regretted that more flying had not been done in Scotland this year, owing to the extremely bad weather, but, he said, he judged from the recent municipal elections that there was a prospect in future of many "dry Summers" in Scotland.

The Matter of Guests.

Major-General Ruck, for eight years Chairman of the R.Ae.S., in proposing the toast of "The Guests," gave a long list of the distinguished people present, and Sir Alfred Keogh replied briefly. Now it is worthy of note that so far as one could discover, the Society had entirely omitted to invite the Press, despite its President's desire that proper publicity should be given to aviation. Which is distinctly comic.

The result was that the function, which might have given the Society precisely that publicity which Lord Weir said was needed, was practically ignored. It did not receive, in fact, anything like as much attention in the newspapers as did a person charged during the same week with stealing wireless equipment from Kenley Aerodrome, or two others charged with drawing money on forged Air Ministry warrants.

M. Damblanc, the famous French helicopterist, expressed his amazement next day at this state of affairs. There was, as he said, at the dinner an actual present Under-Secretary of State, a former Minister for the Air was Chairman, and a former Under-Secretary (General Seely) was also present, besides several Peers and Peeresses, and a whole gathering of notable scientists and other important people. Yet the affair was treated by the Press as of no importance. M. Damblanc said that in France, where newspaper editors are intelligent on the subject of aviation, such a gathering would have occupied columns.

The Attitude of the Press.

Perhaps, after all, the society did not miss much advertisement by not inviting newspaper people. We of the technical Press could hardly expect to be invited, for it is our job to boom aviation, and with it the Royal Aeronautical Society, of which most, if not all, of us are members, but one might have expected the Society to invite the Editors-in-Chief of the leading daily papers, even though they might only have sent "hooligan reporters" in their stead.

It so happens that the only papers which paid any real attention to the affair were the *Daily Telegraph*, of which the aeronautical representative is Major C. C. Turner, one of the earliest of present-day aeronautical people, and the *Morning Post*, in which Mr. Massac Buist, also a pioneer of aeronautics, devoted nearly a column to the Society's dinner, chiefly with reference to Lord Weir's plea for greater publicity. The *Daily Mail*, "the Paper which Discovered the Air," ignored the affair completely, therefore one assumes that it was not asked to the dinner. Major Turner and Mr. Buist doubtless attended as members of the Society and not as guests.

Mr. Massac Buist's Explanation.

Mr. Massac Buist in his excellent article explains quite lucidly the position of the average newspaper in this matter of publicity. Says he:—"All those who have the interests of aviation at heart must agree with him (Lord Weir) that it

is regrettable that so much prominence should be given to aircraft accidents as compared with the amount of space and prominence accorded to recounting the progress of aviation, alike as regards the ever-increasing mileage flown per accident and the real problems as each presents itself or fresh stages of development are achieved from time to time. For instance, the recent Air Conference resulted chiefly in the Press publishing accounts of a proposed colossal tower for mooring giant airships. That was because reporters are too often directed 'to get a live story out of it.' "

A Damning Indictment.

"Lord Weir and other aviation enthusiasts must not base their expectations of progress on the possibility of any alteration of human nature, or of the principles on which newspapers in general are run. The Press in general has educated the public to be always and increasingly intolerant of being bored. The most we can hope for from the Press as a whole in regard to aviation is that, for the time being, it shall mention the subject as often as possible in terms which will express faith in the present and future of the movement. Beyond that we can scarcely hope to go at present."

Only so bold a writer as Mr. Buist, and only the *Morning Post*, which is never afraid of boring its readers by giving them sound information to read, would dare to print so damning an indictment of our newspaper system. It is enough to get Mr. Buist expelled from his journalistic trade union, if he happens to belong to one, and it is enough to get the proprietress of the *Morning Post* expelled from the Employers' Federation of Newspapers, or whatever it calls itself—if her ladyship belongs to one. But as neither journalists nor average newspaper proprietors ever read anything so solid and sound as Mr. Buist's article, their offences will probably pass undetected. And one is not afraid of giving them away in this paper, for one knows that neither journalists nor newspaper proprietors have yet risen to the intellectual or educational level of reading THE AEROPLANE.

Possible Wisdom.

On the whole, therefore, perhaps the Society was wise in ignoring the Press, for nothing in the nature of a "live story," or of "heart-interest" was said in the speeches. And the Press has not yet discovered Lord Weir as one of the world's great humorists. The elephant story alone should make him famous.

Some day if he is not careful he will take the place of Mr. Justice Darling—with a dash of Dean Inge—as the source from which the Press will draw, and as the person on whom the Press will father, all the good jokes of the day. But that time is not yet, so if the Press had been present his pawky humour would have been ignored, despite the fact that when he rises to speak one feels at once that here is a real personality, and despite the fact that when he has spoken all other speeches fade away into the position of an ordinarily good stage "turn" after Harry Lauder's performance.

Nevertheless, it is one of the needs of Civil Aviation, as Mr. Buist suggests, that the Press shall "mention the subject as often as possible in terms which will express faith in the present and future of the movement." Therefore one ventures to suggest how something may be done in this direction.

A Suggestion to the Royal Aero Club.

Before very long, presumably, the Royal Aero Club will be holding its annual banquet. Then will be the opportunity to get the right sort of publicity in the Press. Let the Chairman, whoever he may be on that evening, be primed with a few "live stories" for the Press, with "heart interest" if possible, but very carefully selected so that aviation may not be made ridiculous.

Let some important official of the Air Ministry be asked to propose or reply to some toast or other, and let him also be requested particularly to emphasise the live story plus heart interest side of the business. For example, nobody yet has sprung on the Press the actually existent fact that in the next war fighting aeroplanes will go into action by battalions, each pilot equipped with a wireless telephone, and manœuvring to the actual word of command in a way which is impossible even for infantry in modern war. That ought to appeal to the most unimaginative or jaded journalist.

Then, and most important of all, let somebody with a handle to his name, and without an obtrusive conscience, propose the toast of *The Press*. Let him "lay it on thick" concerning all that the Press has done for aviation, and how the Air was discovered by the Press—let him above all omit any misplacedly humorous reference to hot air.

Those who run these aviation gatherings have hitherto omitted the toast of *The Press*, ignoring the fact that at motor-mongering banquets and other commercial functions this is regarded as the toast of the evening. The omission has been excusable, for hitherto aviation has not been a commercial affair. This, however, is the beginning of the era of commercial aviation, and so this toast—dreary as it is—has now assumed considerable importance, for obviously when it is part of the programme, the Press cannot ignore that particular function.

The really important people on the Press, who have so often expressed their faith in aviation, should be particularly invited on this occasion, and the senior two or three of them should be asked to speak. Lord Northcliffe, Lord Burnham, Lord Riddell, Mr. Gwynne, Mr. Blumenfeld, Mr. Garvin, Mr. Rees, Mr. Bone: the editors-in-chief of the *Times*, the *Daily Mail*, the *Chronicle*, the *Daily News*, the *Westminster Gazette*, the *Evening News*, the *Evening Standard*, the *Daily Mirror*, the *Daily Sketch*, and any other papers of note, should all be sent personal and pressing invitations. It would not cost the Club much, and it would be well worth while. And our good friend Harold Perrin is quite competent to arrange it all satisfactorily.

If these distinguished persons could be induced to attend in person and listen to a few sound speeches on aviation by people who really matter in the aeronautical community, they would certainly see to it that their "hooligan reporters" did not thereafter send in the appalling drivel which appears only too frequently in their papers. Thus at any rate a reasonable attempt may be made to achieve the useful kind of publicity which Lord Weir desires, and at the same time to keep within the limits prescribed by Mr. Massac Buist. And so Civil Aviation may obtain some of the advertisement which is one of its chief needs at the moment.—C. G. G.

ON FLYING CLUBS.

Ex-officers of the Flying Services all over the country are wondering if they will ever handle the joy-stick again, and their general idea appears to be to trust the Government to produce the long-promised Territorial Air Force.

But they might assist the Government and help aviation in the meantime by showing their desires.

One way is by the formation of local flying clubs. This sounds an expensive business, but in reality is not so very dreadful. Such towns as Birmingham, Glasgow, and Newcastle are sure to possess a few hundred ex-pilots in their midst, and it only requires their meeting together to set a club going.

In Liverpool, where such a club exists, the first meetings drew large numbers of old friends together all keen to fly.

The chief necessity is to procure the necessary aerodrome, hangar and machines, but once over these difficulties the club can make itself self-supporting. Carnivals can be arranged in the summer when the takings will pay for the rent of the ground and dances in the winter pay for the club-room expenses.

All that is required is an enthusiastic chairman and secretary, both of whom must be ex-pilots, or they cannot keep the main object in view.

It is surprising how many outsiders are interested and keen to help. And outside help is often very material, for large numbers of business concerns are quietly watching aviation and are willing to help any effort which may serve them in the future. Financial help from local magnates is welcome but difficult to procure at present when civil aviation is so dormant.

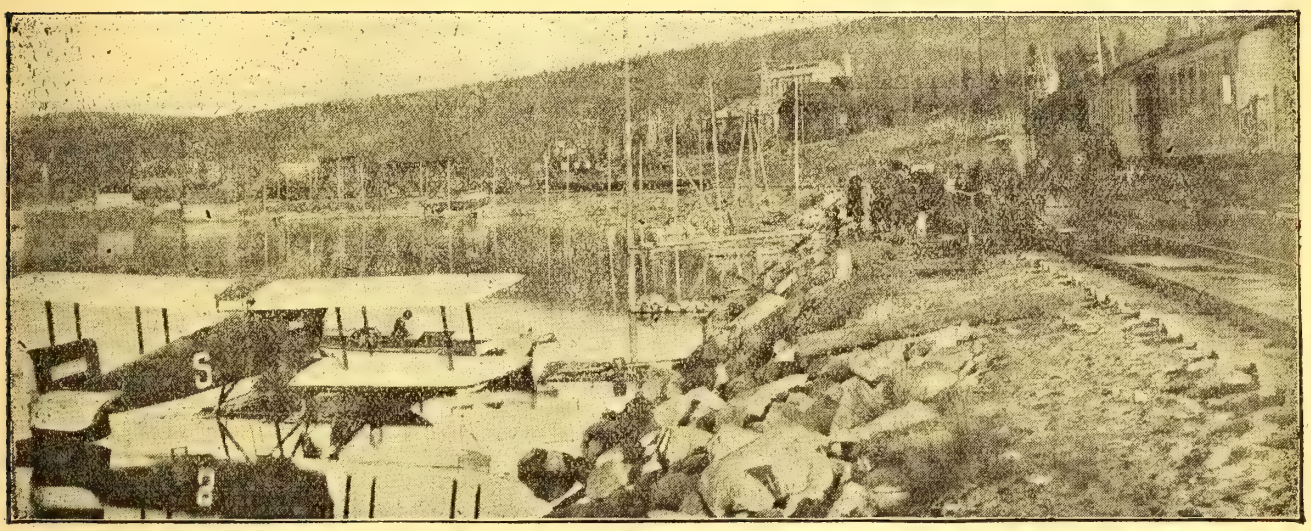
It is up to those who can fly to remember the old war days and arouse their enthusiasm to help it along, so that the restless old mother-country will not fall behind in this most important branch of defence and commerce.

The summer is coming with its blue skies and fairy cloudlands, which we used to love, and if we want to be up amongst it again the flying club is the key to the road up there.

Then we shall see in the daily Press graphic accounts (with photographs) of the contest in the clouds between the Liverpool and Glasgow flying clubs, and the results of the there-and-back race to Paris of the Hendon (London) Club. For we cannot let "Old Jerry" shows us the way in the sport of the future.—R. M. D.

[R. M. D's. very practical suggestion deserves support. Will the Royal Aero Club Committee bestir itself to foster this movement? In years gone by there were numerous local Aero Clubs affiliated to the Aero Club, but all have died of mere inanition. Now is the time to try to revive local interest in flying. The local newspapers will certainly help any efforts in this direction. The Royal Aero Club can give valuable moral support to these local efforts by influencing people of importance in each district to give their patronage to the movement and by impressing the local Press with the national importance of encouraging aviation. It will be interesting to see whether the Committee of the Royal Aero Club has the energy to avail itself of this new opportunity.—C. G. G.]

FARTHEST NORTH



Here is seen the Terminal Station at Porjus, Sweden, whence an air line is the only rapid means of communication with works in progress 100 kilometres away at the head of the lake. This is the farthest North air line in the World, and is inside the Arctic Circle.

The machine in the photograph is a Fairey Biplane (Rolls-Royce Engine) sold to the proprietors of the Air Line by Lieut-Col. G. L. P. Henderson, M.C.

The floats are those from Col. Henderson's first Fairey Seaplane which was wrecked in Dover Harbour early this year. They were stored for some months, and for several months during the present Summer and Autumn they have been continually in use in Sweden, very seldom out of the water, except when flying, and they have shown no signs of leaking.

The machine itself is a standard Fairey Seaplane, merely altered to carry three passengers and a pilot.

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CONCERNING THE LONDON TERMINAL AERODROMES.

Considerable interest has been aroused by various paragraphs in the Press concerning the ownership and operation of the two London terminal aerodromes at Cricklewood and at Croydon. The facts of the matter appear to be that the Cricklewood Aerodrome is the freehold property of Handley Page, Ltd., having been acquired from the previous owners of the land, the Ecclesiastical Commissioners and St. Bartholomew's Hospital. The Croydon Aerodrome, more correctly known as the Waddon Aerodrome, is actually the property of the Ministry of Munitions, and the aerodrome, together with what was originally the National Aircraft Factory at Waddon, is held under licence from the Ministry of Munitions by the Aircraft Disposal Company, Ltd., for which Handley Page Ltd. are the appointed selling agents.

Apparently the Department of Civil Aviation has the use of the Croydon Aerodrome by arrangement with the Aircraft Disposal Company, Ltd., during such period (three years) as the licence from the Ministry of Munitions is in existence.

The stories current concerning the removal of Handley Page Transport, Ltd. (the air line which is affiliated to Handley Page Ltd.), from Cricklewood to Croydon, seem to have originated from the fact that Handley Page Transport, Ltd., being affiliated to the actual owners of the Cricklewood Aerodrome and the licensees of the Croydon Aerodrome, have made arrangements to run their machines from Brussels and Paris alternatively to Cricklewood or Croydon, according to the state of the weather, the machines being notified by wireless telephone before approaching London as to which aerodrome is at the time free from fog. For example, on Saturday last, when it was foggy at Cricklewood, Handley Page G/EAMA was warned of the fact and landed at Croydon, proceeding to Cricklewood the next day.

It is hoped that all other cross-Channel air lines will co-operate with Handley Page Transport, Ltd., in using the Croydon or Cricklewood Aerodromes alternatively according to the weather notified to them before leaving France or when arriving on this side of the Channel. In this way, no matter what the direction of the wind, it is practically certain that machines will be able to get through from the Continent to one or other of the aerodromes, and so the delay and discomfort, and incidentally a certain amount of danger, caused by landing outside London owing to fog or low clouds, will be entirely eliminated, and the operation of the cross-Channel services will be accelerated and made more certain.

As regards the burning of scrap machines and the breaking up of scrap engines at Waddon, reported so noticeably in the *Evening News* recently, it may be assumed that the Aircraft Disposal Co., Ltd., know what is and what is not a saleable article, seeing that some millions of pounds' worth of aircraft disposal material has already been sold, every civilised country in the world, and some which might be considered only partly so, being among the buyers. That being so it would be extraordinarily foolish to turn the big sheds at Waddon into a museum for aeroplanes and engines which can never be sold as such, when the material in them has a certain limited value as scrap.—C. G. G.

WIRELESS TROUBLES.

It seems to be about time that the wireless services on the London-Paris air route were overhauled and accelerated. There are frequent complaints of machines arriving at Croydon or Cricklewood before they are reported as having left Paris, and as far as the reports from St. Inglevert and Lympne are concerned, one believes that it is more common for the machine to arrive before the report than for the report to arrive before the machine.

One of the best examples of this state of affairs occurred on Nov. 10th, when a pilot who had landed at Croydon was handed, an hour and ten minutes after his arrival, a note straight from the wireless cabin announcing his departure from St. Inglevert.

What with continual delays by the postal services at each end of the Paris air route and this curious dilatoriness in the wireless departments, it would seem that the somewhat despised aeroplanes are themselves about the only thoroughly efficient part of the air line system, with the exception of the operation and organisation of the Croydon aerodrome itself.—C. G. G.

THE H. G. HAWKER ENGINEERING CO., LTD.

With the formation of the H. G. Hawker Engineering Co., Ltd., the official registering of which is dealt with on page 833 under Company Notices, it is exceedingly comforting to see among the list of five directors the names of Messrs. T. O. M. Sopwith, F. Sigrist and H. G. Hawker.

When it is realised that the Sopwith-Sigrist-Hawker combination was practically responsible for the great name earned by Sopwith aircraft before, and more particularly during, the war, it must certainly come as a blow to all those many pessimists who forsaw with the collapse of the Sopwith Aviation and Engineering Co., Ltd., the complete loss to the Aviation Industry of those very capable personalities.

Although the company is registered primarily to carry on the manufacture of the Bennett motor bicycle, the fact that aircraft is mentioned in the syllabus shows that faith is still retained as to the future of aviation. Judging from the great esteem in which the Flying Services held Sopwith aircraft during the war, the considerable amount of good work done in the Antipodes by the Larkin-Sopwith Aircraft Co., and the huge possibilities that exist throughout the British Empire for commercial aviation, one can confidently look forward to seeing new types of aircraft emanating from the works of the H. G. Hawker Engineering Co., which, although new in name, will still bear the reputation and embody the experience and knowledge gained since the formation of the Sopwith Aviation Co. in 1911.—L. B.

A NEW REASON FOR AIR MAILS.

Those who still have hopes for the air mail services, in spite of the stupidity or deliberately obstructionist methods of the various post-offices, will be interested to know of a case which supplies a very good reason for using the air mail services, although no acceleration in delivery has been obtained. A correspondent writes that a friend of his recently applied for a position in Rome and sent his application by air post, presumably as far as Paris.

Whether his letter reached the firm earlier than others or not, or whether the directors of the firm were impressed by the applicant's enterprise in using the air post, is not known to the correspondent in question, but the fact remains that the applicant soon afterwards received a wire from the firm offering him the position, which was of some importance.

Thus it may be seen that both individuals and business firms may find it worth while to use the air mail, not in order to accelerate their correspondence, but in order to impress those with whom they correspond with the fact that they at any rate are progressive in their ideas and methods. If the air posts cannot provide acceleration they can at any rate provide an advertisement.

ROYAL PATRONAGE.

H.R.H. the Duke of York, K.G., recently accepted from Aero Films, Ltd., an aerial photograph of Windsor Castle. This photograph was seen and admired by H.M. the Queen, who asked if a copy of the photograph could be secured for herself to hang in the Library at Windsor Castle. A copy was presented, together with another photograph showing the castle from a different position.

Aero Films, Ltd., announce that they are doing a good deal of aerial survey work for town councils and estate agents in England, and that aerial survey parties are being sent abroad for work on plantations and undeveloped land.

CIVIL AVIATION IN SWITZERLAND.—A Handley Page Aeroplane, piloted by Mr. Hope, which gave an excellent display at Lausanne.

Promise and Performance

The latest performance of the

NAPIER

450 H.P. Aero Engine—**the highest prizes in the three Air Ministry Competitions** were secured by Napier engined machines—places it above all others, and emphasizes it as the *proved Best.*

Its prototype on the road—the 40-50 H.P. Six Cylinder Motor Carriage—built in the same factory, by the same skilled workmen and of the same high-class materials, gives the same reliability, efficiency and satisfactory performance on the road as the aero engine does in the air.

A trial drive will enable you to realise the fulfilment of this promise of exceptional performance on the road.

Full particulars gladly sent on application.

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NAVAL AND MILITARY AERONAUTICS.

AIR FORCE.

ROYAL AIR FORCE—SHORT SERVICE COMMISSION.

The Air Ministry announced on Nov. 22nd, that the regulations issued in August, 1919, whereby provision was made for obtaining part of the officer personnel of the Royal Air Force by granting short service commissions for a period of three years, with a possible extension to four years:—

(a) To officers then serving, and
(b) To demobilised officers,

have been revised.

The new regulations extend the right of entry for short service commissions to civilians, and make service on short service commissions by direct entry from civil life a permanent feature of the Royal Air Force, thus maintaining the necessary proportion of junior officers and providing a steady flow into the Reserve

Applications for short service commissions, under the new regulations can, therefore, now be submitted for a course of training which commences on February 1st next year.

The candidates must not be less than 19 and not more than 25 years of age at the time of entry. They must be of pure European descent and the sons of natural-born British subjects. Each candidate will be examined by a Medical Board and interviewed by a Selection Committee in London

Employment will be for a period of four years on the active list, followed by a period of service in the Reserve. During the period of service on the active list an officer may be called upon to serve in connection with any type of aircraft in any part of the world either ashore or afloat.

The rates of pay and allowances and the conditions of issue will be those normally in force from time to time for permanent officers of the Royal Air Force. Officers transferred to the Reserve after completion of their full period of service on the active list, will be paid a gratuity of £75 for each completed year of active service at full pay, and will be paid retaining fees whilst in the Reserve, subject to satisfactory completion of the training required.

Copies of the detailed regulations may be obtained by application *in writing* to the Secretary, Air Ministry, (S.7), Kingsway, London, W.C.2.

In addition to the candidates required for the course of training commencing on February 1st, a limited number of candidates will also be required later for courses commencing on May 1st, June 1st, July 1st, and October 1st, 1921.

Selection Committees will be held at the Air Ministry in connection with the different courses about December 15th, 1920, March 15th, 1921, April 15th, 1921, May 15th, 1921, and August 15th, 1921, respectively.

Intending applicants, who after reading the regulations are desirous of being considered, may obtain a form of application by applying *in writing* to the Secretary, Air Ministry (S.7), Kingsway, London, W.C.2. Applications must be received at the Air Ministry a clear week before the date of the Selection Committee at which the candidate wishes to be examined.

There are also vacancies for a number of demobilised pilots of the Royal Air Force for entry at an early date. All applicants will be considered provided that they have not been interviewed by an Air Ministry Selection Board subsequent to August 31st, 1920.

The Armistice Day Ceremony.

On Nov. 11th, 1920, at the burial of the Unknown Soldier at Westminster Abbey, the Royal Air Force was represented by Air Marshal Sir Hugh Trenchard, Bt., K.C.B., D.S.O., Chief of the Air Staff, who was one of the pall-bearers Captain H.R.H. the Duke of York, K.G., R.A.F., wore R.A.F. uniform. An airman of the Royal Air Force formed one of the guard of honour about the grave, and thirty-one officers and sixty other ranks of the Royal Air Force took part in the procession. The march discipline of the R.A.F. was noticeably good.

H.M.S. "Ark Royal."

H.M. Seaplane-carrier *Ark Royal* (Cmdr. R. Watkins Grubb) has returned to England from service in the Mediterranean. She left Sheerness on Nov. 13th for Rosyth, where she will pay off for alterations and repairs.

H.M.S. "Eagle."

It is announced that upon completion of trials the seaplane-carrier *Eagle* will proceed to Devonport, where she will be berthed pending arrangement for her to be taken in hand at a Royal Dockyard. On arrival at Devonport she will be paid off in charge of a care and maintenance party and placed under the orders of the Rear Admiral, the Reserve Fleet.

Army Officers and the R.A.F.

A scheme has been instituted whereby a number of Army officers will be seconded for service with the Royal Air Force and a number of Air Force officers will be seconded for service with the Army. The War Office states that a larger proportion of junior officers is required by the Air Force than is usual in the other services, and it will be advantageous for a number of Army officers to gain insight into the ways of the R.A.F. This knowledge of Air Force methods should prove useful in time of war for purposes of co-operation between the two services.

The War Office is asking for volunteers for service with the R.A.F. Thirty officers are required and their service will begin in March, 1921. Further officers will be called for at intervals. A start has been made, and a few Army officers have been already seconded to the R.A.F., and will be gazetted this month. The officers selected will be between twenty-two and twenty-eight years of age and will be seconded for a period of four years. They must have had at least two years' service.

Owing to the fact that the majority of R.A.F. officers have undergone an Army training, the number of Air Force officers seconded to the Army will not be at present so great as in the former case, but as time goes on the number will be increased. It is not considered necessary for the period of attachment for the Air Force officer to be so long as that of the Army officer.

Enlistment of Civilian Employees in the T.F.

The Army Council has decided that the enlistment of civilian employees of the R.A.F. in the Territorial Force shall be limited to 2 per cent. of the total number of civilian subordinates employed in any unit, stores depot, or directorate of works and buildings. These men will only be allowed to enlist in the T.F. Royal Corps of Signals, R.E., R.A.S.C., and R.A.O.C., where their technical qualifications can be used to the best advantage.

An Accident.

On Nov. 17th an aeroplane which was delivering mails at the Waterford Military Barracks came into contact with the wireless aerial in the barrack ground and fell on the roofs of two houses in Barrack Street. The pilot, Lieut. Brick (?) and the observer were seriously injured, and the machine was destroyed.

The R.A.F. Cadet College Magazine.

Those who are responsible for its production deserve the highest congratulations on the first issue of the Royal Air Force Cadet College Magazine. It is almost everything that such a magazine should be, and it is definitely everything that previous attempts to run R.A.F. publications have not been. There is no attempt at being funny, but it is by no means lacking in humour in the right places.

The magazine begins very properly with a benedictory note from Air-Marshal Sir Hugh Trenchard, Chief of the Air Staff, in which he impresses on the cadets that their first duty is to learn how to organise and administer a great service both in peace and war. This is followed by another brief note by Mr. Winston Churchill, who tells cadets that they are now training "to rival and no doubt excel" the feats of their forerunners in the Service so that the name of the Royal Air Force shall be "feared and respected throughout the world." There is a fine truculence about that last phrase which is worthy of Mr. Churchill's variegated career. One hopes that present and future generations of cadets will live up to these injunctions.

All of the College notes are remarkably interesting and show that those in charge of the College are taking proper care for both the bodies and brains of their charges. The composition of the lending library, as catalogued in the magazine, indicates a nice appreciation of what is good for the youth of to-day. This is not surprising when one considers that Mr. S. P. B. Mais, M.A., is the Professor of English at the College. Particularly fascinating is the article on the Sporting Resources of Lincolnshire, and the man who can read the section on hunting without longing to get across a horse again must be a strange specimen of humanity

It is to be hoped that the magazine will maintain the high literary quality and the excellent Service tone of this first number.

The photographs are excellently produced and give one a proper idea of the inwards of the College as well as some of the personnel. Very properly the frontispiece is an excellent portrait of the Commandant, Air Commodore C. A. S. Longcroft, D.S.O.

One ventures to echo Sir Hugh Trenchard's hope that the magazine will live and prosper and be a great help in forming and guiding the destinies of the College. Those who take an interest in the College can, one believes, become subscribers to the magazine for the small sum of 6s.

Old Comrades' Association, W.R.A.F.

A reunion meeting of the London branches of the W.R.A.F., O.C.A., was held at the Imperial Institute, by kind permission of the University of London, on Friday evening, about 150 members of the Association being present.

The President, Dame Helen Gwynne Vaughan, D.B.E., in the course of a short lecture on "Citizenship," said that the "Authorities" would think twice before they went to war again without the Womens' Services. She went on to say that the best sort of preparedness for future emergencies was individual efficiency and general *esprit de corps*. Her remarks concluded with a brief tribute to the R.A.F., which was greeted with loud applause.

Dancing occupied the remainder of the evening, and about 25 new members joined the Association.—C. M. S. H.

73rd (Yarmouth) Wing Reunion Dinner.

A Reunion Dinner of all officers who served under the Yarmouth Command during the late war was held at Oddenino's on Saturday, Oct. 23rd, under the Presidency of Group

(*Continued on page* 829.)

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

In a somewhat lengthy communication, Mr. G. Tilghman Richards and Mr. R. J. Butler, of the firm of Wm. Beardmore and Co., reply to the aspersions recently cast upon the steam turbine as an aeronautical prime mover by Capt. Sayers.

At almost equal length Capt. Sayers replies to their defence.

It should be pointed out that, if the Aircraft Industry to-day were in a sufficiently prosperous condition to spend large sums on costly experiment, work on steam plant would be worthy of support. In the present state of affairs, however, such money as can be spared for research and experiment can be better spent on improving the internal combustion engine than on attempting to develop a type of power plant which suffers from overwhelming drawbacks, and which offers only problematical advantages over its existing rival.

The very interesting paper by M. Damblanc on the problem of the Helicopter, read before the Royal Aeronautical Society on the evening of Nov. 18th, is reported in abstract on page 822. It is hoped that all those who are interested in the subject of direct lift machines will endeavour to obtain the full reprint of the paper, which will appear in the Journal of the Society.

A somewhat important communication as to the value of the Air Ministry's Certificates of Airworthiness, regarded from the Insurance Companies' point of view, is reproduced on page 824.

THE STEAM TURBINE QUESTION.

The following letter has been received :—

Nov. 10th, 1920.

Sir,—With reference to the critical article appearing in your number of 20th ult. under "Aeronautical Engineering," which traverses the hopes expressed by Air Vice-Marshal Sir Edward Ellington regarding the future development of steam motive power plant applied to aeroplanes, we feel that, having been intimately concerned with the exploration work in this field since early in 1917, certain of the criticisms therein contained call for some remarks.

Imprimis. Why head the subject "The Steam Turbine Scare"? The steam turbine, having proved itself to be the safest and most reliable of all prime movers, the title is distinctly inept. Surely if the two qualities mentioned, viz., safety from fire risk and low fuel consumption, can be attained —the first is certainly assured—then the term "Scare" should be replaced by "Hope."

Some Facts.

Whilst it is generally agreed that a high rate of revolution is essential for maximum efficiency of a steam turbine, there exists in a highly developed state a "type" which consists of two elements rotating in opposite directions—thereby attaining high relative blade speed without excessive shaft speed, which lends itself admirably to gear reduction, and to a suitable speed for airscrews. This turbine is not the De Laval single stage type, but is multi-stage reaction turbine, and the gearing for the purpose can be made at a fraction of the weight of the De Laval type mentioned, without serious prejudice to the efficiency of the plant.

Even in the central station type of this turbine the weights of the rotating elements, without the employment of special materials or lightening in the aircraft sense, are in the neighbourhood of 0.3 lbs. per horse-power, whilst the outer casing which is only subject to an exhaust pressure of 1 lb. absolute can be made of aluminium at an estimated weight of 0.15-0.2 lb. per horse-power, which, together with a further 0.1 lb. for shafts, totals 0.55 to 0.6 lb.

Condensing Plant.

The condensing plant mentioned by Air Vice-Marshal Ellington as being the stumbling block, is not, as your reviewer states "not so obviously necessary," but is a vital necessity, as the steam consumption, irrespective of the amount of water to be carried, increases very rapidly if the turbine is operated "non-condensing," and also the fuel consumption is increased pro rata. Moreover, 12½ per cent. water leakage loss would not be tolerated even in a land station, so that the extra make-up feed stated to be necessary is quite outside the region of current practice. The weights of the remainder of the auxiliary pumps required for operating the steam plant are extremely moderate, as reference to the advertisements in the Engineering Press will indicate.

The Effect of High Fuel Consumption.

The figures quoted by your reviewer regarding the useful load and fuel weight carried during the Martlesham trials have not a strictly parallel bearing on the case, and should, we suggest, be considered in conjunction with our estimates which follow, and the interdependent questions of length of flight, insurance, frequency of overhaul and rate of depreciation.

The author's statement that there is a larger field in power stations for such a plant as sketched above and in his remarks is not at all justifiable. Weight considerations are of practically no moment compared with continuity of supply, the bulk of a station plant does not reside in the turbine, but in the electric generators and equipment, particularly with the type of turbine it is proposed to employ.

The increase in fuel economy would be attained by the use of paraffin of 18,000 b.t.us. per lb., as against coal of, say, 11,500 per lb., it being agreed that an increase of steam economy to any very revolutionary extent cannot be foreseen at present.

Finally, the problem, instead of being entirely below the horizon, is very much in sight, and we are disposed, in view of the large amount of work undertaken on this subject, to concur in the view of Vice-Marshal Ellington that the crux of the question is solely the evolution of a suitable method of condensing.

We append a statement showing an estimate for the performance of a steam plant of 1,500 horse-power installed in an aeroplane of about 30,000 lb. total weight (in which an allowance is made for condensers) upon which we shall be pleased to receive the criticisms of your reviewer and your readers, not only on the performance estimated, but also taking into consideration the controlling factors of reliability, depreciation, overhaul, and safety, and their bearing on the present serious items of insurance and capital outlay.

We have not laboured the advantages which would accrue, such as ease of operation, absence of smell, vibration and noise, flexibility, etc., as these must be obvious to your engineering readers.

The proposition is set forth below in tabular form in each case, being based on a 500-mile journey and neglecting climbing and gliding at the beginning and end of flight.

Firstly, it is interesting to compare the machine speeds with the two types of plant and to note how the time element operates in favour of the steam plant when operating at high altitudes.

Comparative Speeds.

	Petrol. M.P.H.	Petrol. Time for 500 miles hrs	Steam. M.P.H.	Steam. Time for 500 miles hrs.
At ground level	110.0	4.55	110	4.55
At 5,000 ft.	104.0	4.81	116	4.31
At 10,000 ft.	93.2	5.37	124	4.03
At 15,000 ft.	—	—	131	3.8
Ceiling (absolute)	11,500 ft.		26,000 ft.	

The comparative weights of power plants would be, roughly, as follows, operating at 10,000 ft. for 500 miles :—

Petrol.	Lb.	Steam—1,500 h.p. Condensing.	Lb.
Engines—Four Napier "Lions" of 450 h.p. at, say, 890 lb. (Giving 375 h.p. cruising.)	3,560	Turbine	900
Radiator, water, piping, and header tanks	1,232	Boilers	3,000
Petrol and oil piping, dope pump, wind pumps and hand pump	142	Water—5 min.	1,200
Petrol tanks (main and headers)	242	Feed tank and mountings	50
Exhaust arrangements	272	Injector	50
Four airscrews	317	Condensate pump	200
Oil tanks	10	Funnel	170
Controls, ignition, shutters, etc.	119	Lubricating oil (5 gall.) and tank	55
Unconsumed oil	22	Piping, fittings, oil cooler, etc.	400
		Fuel tank	243
		Condenser allowance	1,500
		Gearing and shafts	700
		Variable-pitch airscrew	150
Plant with water	5,916	Plant with water	8,618
Fuel consumed 3,310		Fuel consumed (no oil is lost)	5,440
Oil consumed 255	3,565		
Total	9,481	Total	14,058

Comparison of the foregoing aeroplane operating at 10,000 ft. with different plants Wing loading, 10 lb. sq. ft.; lb. per h.p. at ground level, 16.7 full power, 20 cruising.

	Petrol Plant using Grade 1 petrol of .72 spg at 3/9 per gall and lubricating oil at 5/- lb.	Steam Plant using paraffin of .83 sp. g. at 2/- per gall. lb.	Steam Plant using shale oil of .89 spg. at 1. 2/- per gall. lb.
Structure Wt. at 35.5 per cent.	10,668	10,668	10,668
Power plant	5,916	8,618	8,700*
Fuel (and oil consumed for petrol)	3,565	5,440	5,850
Crew, 3 at 180 lb.	540	540	540
Paying load	9,311	4,734	4,242
	30,000	30,000	30,000
Fuel costs for 500 miles	3,310 lb. at 7.2lb/gall. =460 gall. petrol at 3s. 9d. = £86.25; 23 gall. oil at 5s. = £5.75 = £92.	5,440 lb. at 8.3 lb. = 656 gall. paraffin at 2s. = £65.6	5,850 lb. at 8.9 lb. = 656 gall. shale at 1.2s. = £39.4.
Speed, m.p.h.	93.2	124	124
Paying load—			
Ton-miles per hr.	387.7	262	235
Fuel cost per ton per hour during trip	82/6	152/-	103/-
Fuel cost per ton-mile	0/10½	1/2¾	0/10

* Extra allowed for fuel pump and extra weight of tank and supports.

From these figures it will be seen that, though the capital outlay in relation to useful load carried would be high, yet, since steam reliability should certainly enable the machine to earn money on at least twice the number of days per annum, the capital outlay compared with earning power is lower than with a petrol plant. Again, the overhaul charges entailed with petrol-driven machines would be reduced to a practicable figure, even if it were found expedient to completely scrap the boilers each year.

Regarding depreciation charges, given a plant of unfailing regularity of operation, the problem of regular service is raised from the question of contingent engine failure in fog or bad weather to one of such bad weather that a machine could not be landed without undue risk, which means the loss of only a small percentage of days per annum. Constant depreciation and depreciation due to obsolescence should be reduced, roughly, in the proportion of 5 years to 3 for petrol, or three-fifths the present charges.

Crash risk would obviously be more than halved, as the crash risk due to engine failure—the greatest factor—would be almost eliminated.

Depreciation due to deterioration should again be considerably reduced, as the life of a steam-equipped machine would be far longer than the present life of machines. (The adoption of metal structure would also greatly reduce this in both cases.) All the above factors have a direct bearing on the insurance rates, though if these be based on a rate per flying hour there would probably not be much reduction here through the continuity of service expected.

Perhaps Colonel Bristow may be induced by these remarks to give us the benefit of his wide experience of aircraft insurance as concerned with such a plant as forecasted above.

Finally, the following figures showing lb. weight per h.p. of the two plants at the beginning and end of a 500-mile flight at 10,000 ft. are interesting :—

	Lbs. weight of Plant per H.P. developed. At beginning of Flight.	At end of Flight.
Petrol plant	9.475	5.9
Steam plant	9.35	5.75

[These figures do not appear to agree with the weights of plants given in the opposite column, namely 8,618 lb. for steam and 5,916 lb. for petrol.—Ed.]

In considering broadly the future of development of the motive power equipment for commercial aircraft the fact should not be lost sight of that progress has been entirely confined to one particular prime mover, with the result that, whilst the petrol plant has attained the adolescent stage, not to say maturity, the steam proposition, as in the case of the steam automobile, is yet in its infancy.

Moreover, the petrol engine and its accessories were in a highly developed state in the automobile before its adaption to aircraft became general, whereas the growth of steam machinery has been restricted almost entirely to the heavier forms of commercial application.

Progress can only be expected with the vigorous prosecution of experimental research work.

(Signed) Geo. Tilghman Richards,
F.R.Ae.S., M.I.M.E., M.I.Ae.E. (Hons.),
R. J. Butler, M.I. Naval Architects.

A REPLY.

When the article to which Messrs. Richards and Butler take such strong exception was written, it was written in the hope that it would draw from a competent authority some form of defence of the steam turbine as a possible aeroplane prime-mover. It was fairly obvious that Air Vice-Marshal Ellington would scarcely have referred to the steam turbine in such terms as he actually used, had the problem not received at least a certain amount of attention from quarters cognisant of the manners and customs of the steam turbine.

In drawing the communication which is printed above, the criticism of Air Vice-Marshal Ellington's paper has at least drawn a statement of the hopes and estimates of those who may properly claim to speak with some authority on the subject.

The Champions of the Turbine.

Mr. G. Tilghman Richards is—as most readers of this paper know—on the aircraft staff of the firm of Wm. Beardmore and Co., Ltd., and since 1915 has been responsible for the design of all their aeroplanes, having been specially released from the R.N.A.S. to take up this position. His experimental experience of aircraft dates back certainly to 1911, and his general engineering experience and training reaches back to many years earlier.

Mr. Butler, whose name will not be so well known to the readers of this paper, is also a member of the technical staff of Wm. Beardmore and Co., and is an expert upon the design of steam plant, and is naturally well acquainted with the latest developments of steam generating plant, and steam turbine design and operation.

It is therefore fairly safe to assume that their statement of the case for the steam turbine—which bears obvious internal evidence of a firm belief in its future as an aeronautical prime mover—is as strong and as authoritative as it can be made.

If, therefore, it can be demolished, it seems fairly safe to assume that the steam turbine has, for some considerable time, very little risk of competing with the internal combustion engine.

It is to be noted that, except for a statement that it is possible to build a turbine for about 0.6 lb. per h.p. instead of 2 lb.

ROLLS-ROYCE

ROLLS-ROYCE ENGINES made the first direct Atlantic flight and the first flight from England to Australia

Extract from THE GLOBE, Dec. 16, 1919.

"The fact remains that it was the internal combustion motor that made flight possible, and the Rolls-Royce motors in particular that enabled these two glorious conquests of the air to be achieved. The Rolls-Royce car is famed throughout the World as a pattern of reliability, but the Rolls-Royce aero engine has now put the coping-stone on the previous successes of the firm, and so noteworthy a double performance is practically without parallel in the history of the world."

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per h.p., there is practically no item in the original indictment of the turbine which is not admitted.

One Point in Favour of Turbines.

The joint authors have made good use of the one count in favour of the steam turbine—that instead of steadily losing power with altitude, its power is maintained at any altitude.

This has permitted them to compare at 10,000 ft. a steam plant of 1,500 h.p. as against an internal combustion engine plant actually capable of nearly 2,000 h.p. at sea level. This is in itself perfectly legitimate. But they have then proceded to make certain deductions which are entirely unwarranted.

They have compared the speed of the steam machine with that of the petrol-engined machine at various heights. Here they must either take it that at sea level the 2,000 h.p. of the petrol plant will give an excess of speed, or they must allow that, throttled to equal speed at sea level, it is still capable of maintaining equal speed with the turbine set up to some altitude which actually would be in the neighbourhood of 10,000 ft.

The particular engine which they have considered is slightly supercompressed, and it is certainly capable of maintaining 375 h.p. up to 10,000 ft., and of developing that power for a specific fuel consumption of not more than 0.55 lb. per h.p. hr., provided it be fitted with carburetters adjusted for those conditions. And 1,500 h.p., however provided, should give equal speeds on similar machines. Therefore there is no justification for the alleged shorter time of flight for the steam plant in the case which they have taken, and the fuel consumption of the petrol plant will, if anything, be somewhat smaller than the figure assumed for it on the journey in question.

Some Large Assumptions.

Then in assuming for the two types of machine equal structural weight, equal loading, equal weight per h.p., and equal speed at sea level, they have committed themselves indirectly to a number of very questionable assumptions.

They have by inference assumed that they can instal a steam plant weighing all told 8,600 lb. on bearers and supports which weigh no more than those needed for 5,916 lb. of petrol plant. They have further assumed that that plant can be installed in a body or bodies of no greater total head resistance than that needed for the petrol plant. This latter assumption, particularly, is rather important, if only because it raises in an acute form that admitted "stumbling block," the condenser. For the condenser alone they have assumed a weight of 1 lb. per h.p.

The air resistance of a petrol engine radiator is by no means a negligible item in the total resistance of an aeroplane. In a petrol engine some 30 per cent. of the fuel energy is used, some 50 per cent. of it is ejected by the exhaust in the form of waste heat, and roughly 20 per cent. is dissipated by the radiator.

In the steam turbine, at the outside, 20 per cent. of the fuel energy is used, and of the remaining 80 per cent. of the heat energy of the fuel something like 50 per cent. has to be dissipated by the condenser.

It is fairly obvious that it will not be possible to neglect the radiator resistance—for it can only dissipate heat to the air round the machine.

The Question of Space.

The question of the space actually occupied by the plant is also important. Messrs. Richards and Butler dismiss the statement that the field offered by land power stations for any type of turbine which could be used on an aeroplane is much larger than that offered by the aeroplane with the bare statement that the turbine itself even now occupies less space than the electrical generators and equipment. This statement is, as it stands, true, but the inference is entirely false.

In existing central electrical stations using steam turbine driven generators, the steam generating plant, the fuel handling plant, condensing plant, and such essential auxiliaries to the steam turbine itself, occupy a space which is rarely less than six times that occupied by the turbines and generators combined—even when the turbines and generators are of the bulkiest and lowest speed type now existing.

It is perhaps fair to mention here that the present writer has a fairly intimate acquaintance with the design and operation of electrical central stations of large size, and with the detailed analysis of the cost of producing power in such stations, and that he can assure Messrs. Richards and Butler that if they can produce a 1,500 h.p. turbine plant consuming .9 lb. of liquid fuel per h.p. hr. which can be installed in the space available in an aeroplane such as they contemplate, that they are wasting time.

The saving in the cost of land, of buildings and of foundations, which can be effected by the use of such a plant on land, offers much greater financial inducements than does the big transport aeroplane.

But even making the best of their case, and taking a number of very hopeful assumptions, they are unable to offer any better result than a machine carrying one half the useful load of a petrol-driven machine of similar size.

They proceed then to claim that the superior reliability and the lowered fire risk of the turbine plant will reduce the costs of operation, because the turbine machine will require no laying up for overhaul, and consequently it will be possible to carry on a given service with fewer machines and therefore at lower capital costs.

The Reliability of Turbines

Now the steam turbine plant of to-day is of a very high order of reliability. The turbine itself is almost entirely free from mechanical breakdowns. The same cannot be said of its numerous and absolutely essential auxiliaries. Minor breakdowns of auxiliaries are of quite common occurrence even under the best conditions, and continuity of supply is ensured simply by the existence of duplication of auxiliaries.

It is now many years since the writer lost personal touch with the engineering staff of the Glasgow Corporation Electricity Department, and he can therefore offer no personal introduction to the right official, but if Mr. Richards cares to make inquiries in this quarter he will doubtless be treated with courtesy.

And it is suggested that he inquire of the Station Superintendent of any of the Glasgow Corporation Power Stations what continuity of supply that officer could guarantee under the following conditions :—

> Five hours' daily running at never less than the nominal full load capacity of the generating plant. (Such plant has always a certain overload capacity, and nominal full load is equivalent to aeroplane cruising power.)
>
> Boiler plant just capable, when forced to the utmost, of supplying steam for the maximum output of the generating plant.
>
> Condensing plant equally finely cut in capacity.
>
> Steam piping system providing only one single steam path for each turbine unit.
>
> Feed water supplies dependent on injectors only, and feed water supplies to be limited to 0.15 lb. per h.p. hr. during the period of full load.
>
> Each unit of generating plant actually installed to be a completely separated unit, so that a breakdown of any vital part of the unit puts the whole out of action; i.e., it is not possible to run the boilers of one unit whose turbine is out of action, and use them to supply steam to another turbine whose boilers have to be laid up for any reason.

He will discover the central station engineer to be by no means enthusiastic upon the reliability of such an installation, and this despite the fact that even so he will have in mind a plant weighing tons per h.p., where the aeroplane plant can weigh only pounds.

A Parallel Case.

It may be pointed out to the steam turbine advocates that there exist slow running heavy oil engines which show a reliability of running which may be considered to be absolute compared to that of the average present aero engine. In their essentials these engines operate on exactly similar principles to the aero engine.

The modifications necessary in the actual construction to reduce the weight of the internal combustion engine from a few hundred pound per h.p. in the stationary oil engine to the 3 lb. per h.p. of the aero engine are no more drastic than those needed to bring the weight of present types of steam turbine plants down to such figures as those assumed by Messrs. Richards and Butler.

It is fairly safe to assume that such modifications will produce similar results in the case of the steam turbine as those they have produced in the case of the internal combustion engine.

The aero engine, in so far as its actual mechanical structure is concerned, conserves in a very fair degree the reliability of the heavier types of oil engine. The essential auxiliaries such as ignition arrangements, fuel supply systems, cooling arrangements and the like, have, however, suffered very severely from the drastic pruning to which they have been subjected for aeronautical purposes, and it is to them that the unreliability of the present-day aero engine is almost entirely due.

These auxiliaries of the aero engine have been reduced to so small a margin of adequacy that the slightest fault of installation, the smallest derangement of their operations, will lead to their breakdown and eventually to failure of the whole power plant.

It is fairly safe to assume that the steam turbine itself will similarly conserve a very high order of mechanical reliability when the weight of its parts are reduced to the limits allowable by the best possible materials and workmanship. Does it seem likely that its essential auxiliaries will fare better than do the simpler auxiliaries of the petrol engine? Boilers capable of supplying at least 12,000 lb. of steam per hr., and weighing only 3,000 lb.; condensers, able to condense the steam output of those boilers, and of half their weight;

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AEROPLANES

AS RECENTLY SHOWN AT THE AERO SHOW, OLYMPIA.

will anyone well acquainted with really high duty steam plant suggest that they can be regarded with confidence as being likely to give a real freedom from breakdown? Air pumps, to give 28 in. vacuum, at 1/7th lb. per h.p.—will any known maker of such plant quote for their manufacture under guarantees of satisfactory continuous operation?

Reduction gears and airscrew shafts—at less than ½ lb. per h.p.? Ask experienced German designers as to the reliability and the weights of their own best efforts, and examine their records of fatal accidents in Germany, caused by the failure of transmissions of very considerably more substantial type than can possibly be built at such a weight.

Injectors to deal with 12,000 lb. of water per hour for a weight of 50 lb.? Yes—possibly—but will anybody who has had to rely on an injector as his sole method of feeding a boiler with water care to risk his life on the continuous steady operation of such an injector for five hours on end? It is true that one can rely on injectors—under normal conditions—but these are not conditions where the whole water content of the plant, both in water and steam, is less than ten minutes' consumption of the turbine depending on it.

A split boiler tube will soon deplete their stock of water—and even in land plants with easily run water-tube boilers split tubes are not unknown.

An air leak into the condenser will ruin the vacuum, and the turbine output may easily drop by 35 to 40 per cent. therewith—and even with the best constructed of stationary condensers such things do occur.

The oil fuel burners of quite modern torpedo boat destroyers have been known to choke to such an extent as to necessitate their shutting down and cleaning. This is relatively unimportant in a power plant comprising, say, six boilers, each capable of a reserve of output. Will it be unimportant in the proposed aeroplane plant?

Messrs. Richards and Butler say that the reliability of their plant will compensate for the extra weight thereof. They practically assert that they can cut the weight of plant to the very lowest limits without any sacrifice of reliability. It is merely suggested here that something more than assertion is required.

Space does not permit of dealing properly with certain of the methods of controversy which these two authors have employed. These must be dismissed with an expression of regret that that essentially political dodge of taking a phrase—divorced from its context—applying to that phrase a meaning which it does not bear, and then controverting that meaning, should be applied to a technical discussion of this type.—W. H. S.

M. DAMBLANC ON THE HELICOPTER.

The paper by M. Damblanc on "The Helicopter," which was translated and read by Capt. W. H. Sayers on M. Damblanc's behalf before the Royal Aeronautical Society on Thursday, Nov. 18th, was of distinct interest in that few people in this country have ever given any serious consideration to this type of aircraft.

M. Damblanc opened by stating that his aim was to develop the basic arguments which had given him his confidence in the type, and that he would be content if he succeeded, not in convincing his audience, but in interesting them in the cause of the helicopter.

He then proceeded to point out the value for use on ships at sea, for reconnaissance purposes, of a type of aircraft capable of rising and alighting on very confined spaces, and of remaining stationary at will, as a justification for investigating the type.

The general results of the investigations of Colonel Renard into the behaviour of lifting airscrews were then presented, together with the results of certain tests on similar screws working in a current of air at right angles to the axis of rotation, which were carried out by M. Riabouchinsky at Koutchino. These show that the lifting effect of such a screw is greatly increased by such a current, without an increase in the power absorbed: a result which indicates that a lifting airscrew gives better results when the machine of which it is part is moving forward through the air than when it is hovering stationary.

From these investigations, and from tests made on a 1/7th scale model of the lifting screws designed by him for the "Alerion" helicopter, he deduced for the two 7 metre diameter screws of that machine a total lift of 1,400 kg. for an absorbed h.p. of 230.

As the actual helicopter weighs only 1,200 kg. and has a total of 260 h.p., this result promises a reserve of lifting power sufficient to give a reasonable rate of climb.

He pointed that the actual provision of adequate lifting power is but one step towards the realisation of a practical helicopter.

Controllability and stability must also be ensured. Longitudinal and directional control and stability could be secured as in an aeroplane by the use of elevators and rudders.

Lateral stability and control called certainly for some mechanism giving results similar to those of the ailerons of an aeroplane. Various means of providing for such control were being tested and had given promising results, but it was not yet permissible to give any details as to the methods employed.

The problem of descent with stopped engines was one of vital importance, and upon the supposed catastrophic nature of such descent most of the adversaries of the helicopter founded their arguments.

There were two conceivable methods of such descent. One was with airscrews mechanically fixed when the engine stopped, using the blades of the screws as the wings of an ordinary glider. In this condition the efficacy of the blades as supporting surfaces was very poor. With a four blade screw, one blade alone could be operating efficiently, the opposite one would be working with its trailing edge leading, and the other two edge on. Under these conditions very rapid descent was inevitable.

The alternative and only satisfactory method was to allow the airscrews to rotate freely, after adjusting the blade angles to the new conditions of flight so that their sense of rotation remained unchanged, and their angle of incidence was an efficient one.

[This change of position of blades is exactly analogous to the change of attitude of an aeroplane when gliding is commenced. If the engine stops when climbing, and the tail of the machine is held down by the elevators, the machine will slow up, and it is conceivable that a machine could be forced to glide backwards under these conditions—naturally at a bad angle. Actually, the nose of the machine is forced down, and gliding takes place normally under favourable conditions. Each blade of a helicopter lifting screw is to be regarded as a separate aeroplane, and for efficient gliding the nose of each blade must be put down. This is the simplest view of the suggested method of descent.—Ed.]

M. Damblanc proposed the use of automatic centrifugally operated clutches disengaging the airscrews if the engine fails, and showed that the manœuvres necessary to assume this "gliding" position of the screws called only for an elevator control and a means of changing the blade angle of the screw blades.

Tests and calculations indicated that the "braking" force available from freely rotating airscrews increased rapidly with the speed of descent, and that in the helicopter of the dimensions and weight which he proposed, a speed of descent not exceeding 4.5 metres per second could be maintained.

This could be taken care of by known types of shock absorbers, and therefore safe descent under these conditions must be considered to be practicable.

As to the prospects of building an actual controllable machine, the difficulties to be encountered were solely mechanical ones. No new aerodynamic problems were involved, and all the advance in the knowledge of aeronautics due to the development of the aeroplane was available to assist in the design.

But the helicopter, far more than the aeroplane, required the utmost precision of design and of workmanship, and it was in this direction that the real difficulties lay.

He believed that the hydro-helicopter would become practical before the land type, and that 1921 would see the first actual flight on a machine of the type. The probable characteristics of such a pioneer machine would be about as follows:—

Total weight	800 kg.
Useful load	150 kg.
Engine power	120 h.p.
Climbing speed	3 metres per sec.
Horizontal speed	100 km.p.h.

Thereafter a set of films showing some of the details of the "Alerion"—an experimental machine built by M. Damblanc and destined rather for a full size test of the mechanical details of the construction than as an actual flying machine, were exhibited, together with a very amusing "animated sketch" film of a machine of similar type which showed very graphically the disposition of the main organs and the methods of their operation.

THE DISCUSSION.

Dr. WATTS, the airscrew specialist (not the hymnalist), said that the helicopter involved bigger problems than lift per h.p. There were stability, translational velocity, speed of descent, and mechanical difficulties to be considered. For life alone the desiderata were low tip-speed, a high L/D ratio, with a high lift coefficient. A lift of 20 lb. per h.p. was, he believed obtainable. If not, then the helicopter was of no particular use. Stability was the great difficulty. He was also doubtful about the rate of descent either with

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

fixed or free screws. He though that the problems could be solved without the expense of building a full-sized machine.

Mr. Handley Page said that alighting in comfort seemed to be the important thing. He had no doubt about the helicopter's ability to get down. Hovering seemed to him to be an overrated accomplishment. One wanted to get to one's destination by air, not to hover. Translation from place to place seemed to be merely a matter of weight per h.p. Aeroplanes had less head-resistance than any helicopter, and had less heavy mechanism. Also he doubted whether direct lift offered any advantage to a long-distance vehicle such as an aeroplane. Also, now that high-lift wings gave a lift coefficient of 2, less space than ever was needed in which to get off. He certainly admired the courage of the helicopter experimenter, even if he did not agree with him.

Mr. Riach agreed in essentials with Dr. Watts, and expressed his doubt as to whether the rate of descent of a helicopter could be got down to anything like 3 metres per second. He thought it would be nearer double that. As for stability, that could be calculated according to the methods of Professor Bryan.

Mr. Crouch frankly expressed his disbelief in helicopters, and referred to M. Damblanc as a prophet in the wilderness. At the same time he admitted that the paper was interesting.

Sir Edward Ellington proposed a vote of thanks to M. Damblanc for the paper, and another to Capt. W. H. Sayers for achieving the difficult task of translating the paper at short notice and reading it without rehearsal with M. Damblanc.

[As a matter of fact, Capt. Sayers performed a very remarkable feat. The paper only arrived in manuscript and uncorrected from France on Monday morning. Capt. Sayers translated it and corrected it between 11 a.m. and 5 p.m. He was persuaded to read it on Thursday—owing to Mr. Percy Noël having a severe cold. The proofs did not arrive from the Royal Aeronautical Society's printers till after lunch on Thursday, yet at 5 p.m. Capt. Sayers read the paper, while M. Damblanc wrote the formulæ and drew diagrams on the blackboard, and only once did he become at all involved, despite printers' errors and other difficulties.—C. G. G.]

Undoubtedly the audience was deeply interested, though entirely unconvinced. As one distinguished officer remarked afterwards, "Does anybody want a helicopter? Isn't it rather like inventing a new kind of rabbit to lay eggs?"

Mr. Damblanc explained privately that his paper only went as far as he dared to go at the moment, in that he could not disclose the methods which he had discovered for controlling stability, nor could he make known other improvements on which he was still experimenting. At any rate, everybody will wish M. Damblanc good luck with his experiments, whether they believe in helicopters or not.

AIRWORTHINESS CERTIFICATES.

The following letter has been received :—

Sir,—At the recent Air Conference I referred to the fact that airworthiness certificates issued by the Air Ministry could not be relied upon by insurance companies when writing aircraft risks and, in consequence, machines offered for insurance had to be re-surveyed by their experts before the risk was accepted.

This statement has been received by certain departments of the Air Ministry with an amount of ill-feeling, although I anticipated that they would welcome a criticism which might be the means of bringing these departments into closer touch with each other, with a view to improving the situation and ensuring a higher degree of safety in civilian machines.

The present system of issuing airworthiness certificates appears to be very unsatisfactory and would probably lead to disaster if outside influence was not brought to bear in securing greater airworthiness of machines, namely, by the survey carried out by insurance companies' experts.

It appears that, although a machine may be considered defective in design by Government inspectors who are deputed by the Inspection Department to finally inspect the machine for workmanship and material, that Department has no authority to refuse the issue of an airworthiness certificate. The result is that, in carrying out surveys for the insurance companies which I act for, I have been compelled to recommend the non-insurance of a number of machines until, in some cases, considerable alterations have been made, although the owner is in possession of a so-called airworthiness certificate.

In the case of sales of surplus Government machines, the machines are not inspected by Air Ministry inspectors, although the C.G.C.A. issues to the purchaser an airworthiness certificate with each machine.

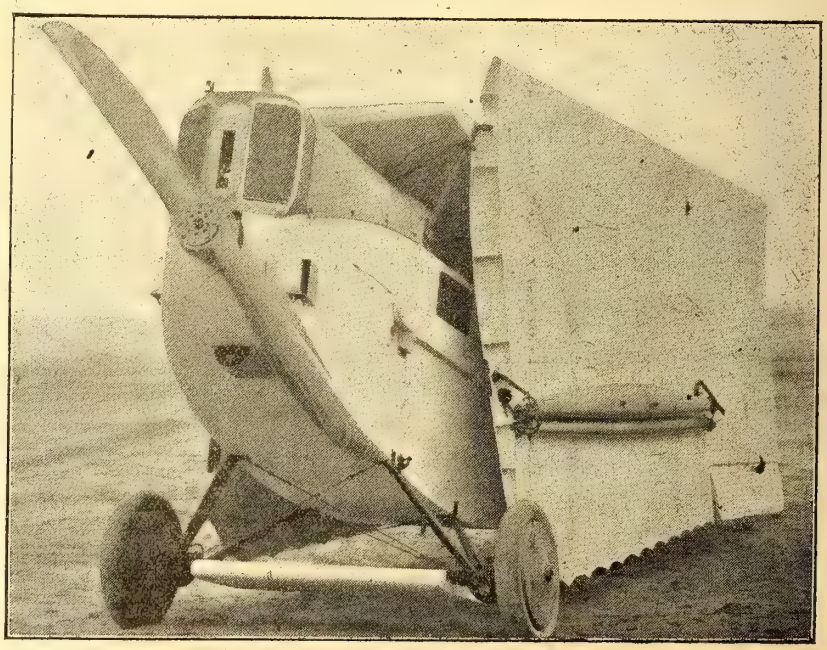
This system of issuing airworthiness certificates is a danger to the public, and immediate action should be taken to ensure that all machines are properly inspected and approved as a whole by qualified engineers (not war-time productions) prior to certificates being issued, and that the expense of such expert inspection be borne by the owner of the aircraft and not, as is now the case, by the taxpayer.

Another important point, which, in the interest of the flying public, must receive attention, is the question of ensuring that machines are maintained in an airworthy condition after the issue of the airworthiness certificate. Under present arrangements a machine is supposed to receive an inspection by a ground engineer before each flight. This is satisfactory, so far as it goes, but the weak link in the chain is the position of the man who carries out this inspection. He certainly holds an A. M. certificate, but, at the same time, is the servant of the aircraft owner and is, in consequence, liable to dismissal should he make himself too aggressive in his demands for renewals or repairs. His position is therefore invidious and lacking in authority.

The future of civil aviation depends to a large degree upon the safety and reliability of machines, and until something is done to ensure this end the present half-hearted confidence of the public will continue, and insurance premiums will still figure heavily in running charges.

(Signed) William Glass, A.M.I.Ae.E., A.M.I.A.E.,
Consulting Engineer to Insurance Companies,
43, Leicester Square, London, W.C.2.

HOW TO SAVE SHED SPACE.—The photograph here reproduced shows the Sablatnig eight-seater commercial parasol monoplane packed for housing or transport. This machine was fully described in "Aeronautical Engineering" for May 12th, 1920. It may be recalled that it is fitted with a Mercédès engine of 260 h.p., and has an entirely enclosed cabin capable of seating up to 8 passengers, though 6, with pilot and mechanic, is the normal complement. The wings are rigidly braced to the lower edge of the fuselage, and can be folded to the position here shown, or replaced in flying condition by two men in a few minutes.



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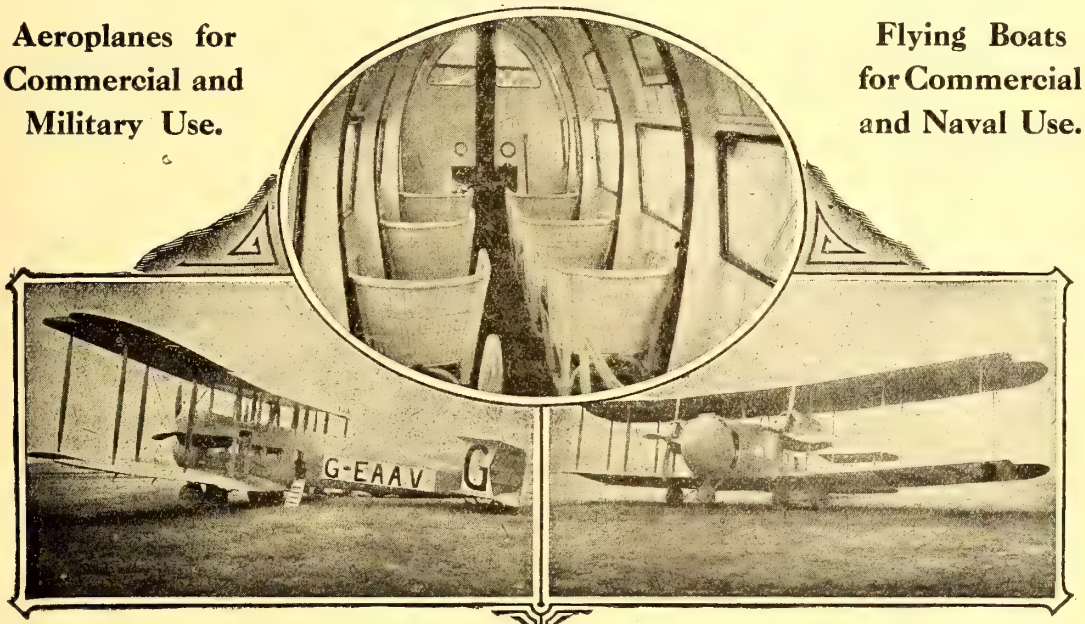

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A SAD WASTE.

The Technical Publishing Co., Ltd., of 1, Gough Square, E.C.4, have sent for review a portly volume entitled "The Motor, Marine and Aircraft Red Book, 1920," the price of which is 21s. net. This paper is naturally most interested in the aircraft matters in this book, and can only judge the rest of the book from its accuracy in relation to aircraft. Judged by this standard the book is slightly worse than useless.

It is true that it contains the names of many prominent people concerned with aviation, though it omits quite a number of important firms, but it also includes many firms whose connection with aircraft has either ceased or is extremely remote. For example, under the heading of "Aero Instruments" one does not find the name of Negretti and Zambra. Under the heading of "Aero-Fabrics" one finds only one Belfast firm—and that a firm of agents.

Under "Aeroplanes," which appear in the estimation of the compiler of the book to differ in some strange way from "Aeroplane Manufacturers," one finds only the name of the Gloucestershire Aircraft Co., and Trevor, Page and Co., of Norwich, the latter a firm whose name has hitherto been unknown to the present writer. The list of "Aeroplane Manufacturers" includes the names of several firms which ceased to manufacture aeroplanes a year or more ago.

The list of "Aero Passenger Services" includes several names unknown to the Aircraft Industry, and omits Aircraft Transport and Travel, Ltd., the Instone Air Line and Handley Page Transport, Ltd.

So far as one can discover by a somewhat rapid perusal, this "Directory" has not discovered the existence of any aircraft firms in the British Dominions Overseas, and it is a little interesting to note that according to the compiler, Canada as a British Dominion does not exist.

The illustrations, which strongly resemble scale drawings, are equally comic when examined in detail.

These few examples will probably suffice to indicate that the book is not merely worthless, but a trifle worse. In view of the dearness of printing and the scarcity of paper it seems rather a pity to have produced the book.

TRADE NOTES.

Nothing Venture, Nothing Win.

After careful consideration, Accles and Pollock, Ltd., have decided that all orders booked by them for weldless steel tubing and tubular parts for cycles, motor cycles, motor cars, etc., shall be subject to no fluctuation in prices in respect of all deliveries made up to and including July 31st, 1921. They are prepared to enter into contracts for supplies up to that date, taking upon themselves the risk of all further increases in costs during the currency of the orders or contracts.

Accles and Pollock, Ltd., certainly deserve all the encouragement that it is possible to mete out to them for attempting to put into practice such a daring policy as this during the present period of labour unrest, when the typical British workman is striving his utmost to get double the money he is worth for doing half the amount of work he is expected to do. It must be that this class of man is non-existent at the Oldbury works, or else Accles and Pollock, Ltd., have solved the problem of instilling into their employees an *esprit de corps* whereby both employer and employee work together for one common object. It is to be earnestly hoped that this scheme will bring in all the orders it deserves.

To Car Owners.

Mr. W. H. Barnes, who will be remembered as Chief Engineer, first of all with Mr. H. C. Barber at the Valkyrie Works, and later with Mr. George W. Beatty at Hendon, has taken over a garage in Collindale Avenue on the way to Hendon Aerodrome and close to the Aircraft Co.'s works. His chief business will be the overhaul and rebuild of cars, but he is also prepared to do any small repair jobs that come along, especially jobs from people concerned with aviation.

In these days, when there are so many complaints about the very bad quality of work done in garages all over the country, it is useful to know of a place where one can depend on absolutely reliable work being done in first-class style.

Mr. Barnes was always noted in the early days of aviation for being able to get just a trifle more power out of the primitive aero engines of the period than most other people, and his experience in handling various types of aero engines during the war has considerably increased his knowledge, therefore one can strongly recommend him to anybody who wants good work done either to cars or aeroplanes.

The Curtiss Company Change of Ownership.

The Willys-Overland Corporation has sold control of the Curtiss Aeroplane and Motor Corporation to C. M. Keys, who has been elected president of the Curtiss Company. The change in control involves the purchase of more than 100,000 shares of the common stock of the Curtiss Company.

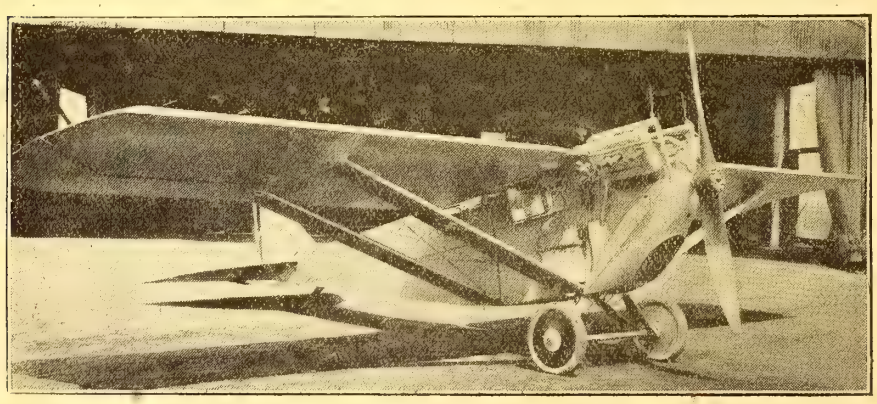
This reorganisation means that the direction of the Curtiss Company reverts to the aeronautical interests which shaped its policy previous to the war-time change whereby the automobile industry secured control of America's most important aircraft firm. While no official announcement has as yet been made regarding the policy the reorganised Curtiss Company will pursue, *Aircraft Journal* is informed from an authorised source that this policy will have for its mainstay the closest co-operation with the aviators who fly Curtiss machines. The latter are naturally best fitted to spread the gospel of flight throughout the country and their advice as to the best means for reaching the not-yet-flying public, being mostly based on practical experience, must remain an important factor of sales' success. The new management fully realise this and will shape its policies accordingly.

The reorganisation also involves some changes in the list of officers and directors of the company. F. H. Russell has been named vice-president in place of Mr. Keys, the new president. J. E. Kepperly and W. B. Stratton resigned as vice-presidents and directors, and J. Harbeck and W. P. Chrysler resigned from the board. C. R. Keys and J. A. W. Smith have been named to fill the resulting vacancies.

The Curtiss Aeroplane and Motor Corporation was incorporated in 1916 and took over the business founded by Glenn H. Curtiss. Control of the new company rested with the Willys-Overland Co. The Curtiss Company early in 1916 took over the Burgess Company of Marblehead, Mass., and controls the Curtiss Aeroplane Company, the Curtiss Exhibition Company and Atlantic Coast Aeronautical Station. In November, 1917, a new plant, which was built at Buffalo, began operation. It cost approximately 4,000,000 dollars. This plant was eventually sold to the Government. In September of last year a Bill was introduced in Congress to pay the Curtiss Corporation 6,114,126 dollars in settlement of war contracts and for the purchase of the Buffalo plant. The present plants of the corporation are at Buffalo and Garden City.

The authorised capital consists of 303,000 shares of common stock of no par value, and 6,000,000 dollars 7 per cent. cumulative preferred stock of 100 dollars par value. Outstanding common stock amounts to 218,060 shares and the preferred outstanding amounts to 5,463,100 dollars. The company has no funded debt. All of the common and preferred shares are held in a five year voting trust, expiring Jan. 14th, 1921.

In the balance sheet of Dec. 31st of last year the plant is valued at 6,645,248 dollars and the goodwill at 2,297,280 dollars. Inventory at that time amounted to 2,883,718 dollars. Gross sales in 1919 were 11,805,808 dollars, and the surplus for the year before deduction of Federal taxes, was 1,939,970 dollars.



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NAVAL AND MILITARY AERONAUTICS.

(*Continued from page 810.*)

Captain C. R. Samson, C.M.G., D.S.O., A.F.C. Keen regret was expressed at the cancelling of Service Leave, which prevented many officers from attending.

After the loyal toasts had been honoured, the health of the President was proposed by Lieut.-Colonel Vincent Nicholl, D.S.O., D.S.C., in a witty and reminiscent speech. This was ably seconded by Major Egbert Cadbury, D.S.C., D.F.C. In reply, the President said how proud he was of the Yarmouth records and traditions, and said how he wished he still had the old Yarmouth officers serving with him at Coastal Area. Finally, he suggested that a cablegram be sent to the many Canadians who had served at Yarmouth through the Air Board of Canada, so that Colonel Leckie, D.S.O., D.S.C., D.F.C., and his gallant band should know that they are still remembered. A vote of thanks was moved by Major Cadbury and Captain J. Hodson to the organisers of the very successful dinner—Captain Featherston and Captain Bloom—both of whom suitably replied. A vote of censure on one absentee for not attending was proposed by Lieut. Hands, which finally found form as a toast to "Absent Friends," to which both Captain James (Canada) and Captain FitzRandolph replied. "Our gallant dead" was proposed by the President and eloquently seconded by Captain Hodson. A committee was then elected to make the affair an annual event to be held on the last Saturday in October; and the President kindly consented to be present next year in the same capacity. An invitation at his instigation is to be issued to all ex-warrant officers of 73rd Wing to be guests at the dinner next year. Major C. J. Galpin, D.S.O., Air Ministry, has kindly consented to receive names and addresses, while Captain S. F. H. Bloom, 17, Welbeck Street, Cavendish Square, W.1, remains as Secretary.

3 Squadron Reunion Dinner.

On Friday, Oct. 15th, a reunion dinner of No. 3 Squadron was held at Gatti's Restaurant, behind St. Martin's-in-the-Fields, when Air Commodore Brook-Popham, C.B., G.C.M.G., D.S.O., A.F.C., the first C.O. of No. 3, took the chair. Twenty old members were present, including Air Vice-Marshal Sir John Salmond, K.C.B., C.M.G., C.V.O., D.S.O., Air Marshal Sir Hugh Trenchard, K.C.B., D.S.O., and Major Maurice Baring were the guests of the evening. It was decided to make the dinner an annual affair, and a committee was formed to keep it alive. The committee are: Air Vice-Marshal Sir John Salmond, Air Commodore Brooke-Popham, Lieut.-Col Powell, Major Cappel, Flt.-Lieut. McClintock, and Flt.-Lieut. J. K. Summers. All old members of No. 3 Squadron who were not present at the dinner are requested to send their addresses to any one of the committee so that there will be no excuse for any member not knowing of any future arrangements.

27 Squadron Reunion Dinner.

A reunion dinner of No. 27 Squadron will be held at the Criterion Restaurant on Dec. 11th. Will any ex-officers of that squadron who wish to attend apply to Mr. E. L. Raworth, Lenzie House, East Parade, Harrogate?

A Matter for 55.

An ex-officer of the R.A.F., now in Canada, writes that he has been reading with interest of the Air Ministry Competition at Martlesham, his interest being increased by the fact that Mr. Keep, the pilot of the Westland Limousine which did so well in the "small aeroplane" class, was a brother officer of his in the famous 55 Squadron, R.A.F., and won his M.C. while in that squadron.

Incidentally, members of 55 may be interested to know that the squadron has recently been with "Q" Force in the Middle East fighting against the Turks.

Furthermore, members and friends of the squadron are reminded that there are still a few copies of the "Chronicles of 55 Squadron" to be had at the price of 10s. 6d. These can be supplied by return of post from THE AEROPLANE, 175, Piccadilly, W.1.

104 Squadron Reunion Dinner.

It has been decided to hold a reunion dinner for officers and ex-officers of 104 Squadron of the Royal Air Force on Saturday, Dec. 11th, next. For full particulars apply to the hon. sec., C. G. Jenyns, Services Club, W.1.

208 Squadron Dines.

On Saturday evening 208 Squadron R.A.F. (No. 8 R.N.A.S.) held its second Annual Reunion Dinner. Sqdn.-Ldr. Bromet, D.S.O., was in the chair and two other officers formerly commanding the Squadron, namely, Major Draper (now Squadron-Leader, R.A.F.) and Major Compston (now Flight-Lieutenant, R.A.F.), were also present together with some seventy officers and men. A number of other former members of the squadron wished to be present but were prevented by hard times and high railway fares.

Squad.-Leader Bromet, proposing the toast of the Squadron, read a number of letters from different members of the Squadron sprinkled over the world conveying their good wishes to their former comrades. Loud applause was drawn by a cable from the existing 208 Squadron, now a permanent Squadron, R.A.F., and stationed in Egypt, wishing success to the gathering. Almost equally hearty applause greeted the reading of a very sportsmanlike letter from a German pilot to the widow of the late Capt. Little, expressing his regret at hearing, on his return to Germany, of the death of that very gallant officer who had brought him down after a hard-fought battle in the air early in 1918. The letter displayed that fine chivalrous spirit which animated the opposing air forces. Squadron-Leader Bromet regretted that the proposed Squadron Association which had been suggested at the last dinner had not materialised, and a committee was formed to investigate the subject at an early date.

In replying to the toast, Mr. Hammond bore witness to the splendid traditions of the Squadron in the field and recalled a number of highly entertaining stories of its doings.

Captain Pinkney, formerly Armament Officer and now "something in the city," proposed "Our Next Merry Meeting," and told a number of very funny stories. Various members of the Squadron were detailed by the O.C. to reply, and shelved the task on one another as skilfully as they doubtless shelved blame for various troubles when in the Orderly Room. Considerable amusement was provided by one member of the Squadron who is famous for celebrating Christmas Day, 1916, by singing "Onward Christian Soldiers" up to his waist in a pond outside the mess after dinner. Altogether it was a very merry meeting.

The Grain Dinner.

The second annual reunion dinner of past and present officers of the Isle of Grain Experimental Air Station was held on Saturday, Nov. 6th, at Jules' Hotel, Jermyn Street. The Chair was taken by Wing-Commander E. Featherstone Briggs, D.S.O., O.B.E., Deputy-Director of the Department of Research, the Air Ministry, commanding at Grain May-Dec., 1917, who was supported by Commander J. W. Seddon, R.N. (retired) (commanding Grain Air Station from its foundation to the end of the year 1914) and by Wing-Commander H. R. Busteed, the present C.O. of the station.

A total of about 40 of the past and present officers were able to attend, and in addition certain constructors and pilots who have been the subject of experimentation at that establishment were present as guests.

An excellent dinner was most pleasantly discussed by the assembled company, and the formal speechmaking which ensued was small in quantity, but of the very best in quality.

Commander Seddon—now unfortunately lost to the R.A.F.—said that when Grain started it was manned by a band of enthusiasts, out not to do stunts, but to get Grain going as one step towards getting flying going. The history of the station since those days proved that the same spirit had descended to the succeeding personnel, and that so long as that spirit endured Grain would continue to be a very important centre in the world of aviation—in fact, he thought it was not too much to say that it might become one of the most important centres of flying research in the world. As long as they eschewed stunts and devoted themselves to the cause of the Service and of flying in general, he would always feel more pride in having had a hand in the making of Grain than in any other incident in his career.

R.A.F. Football.

ASSOCIATION.

The following football matches were played on Nov. 20th. The results of the match are given in each case:—

F.A. Amateur Cup (4th Round).—Horncastle, 0; R.A.F., Cranwell, 2.

London League.—R.A.F., Kidbrooke, 10; Rochampton, 1.

Middlesex Senior League.—R.A.F., Uxbridge, 2; Luton Amateurs, 0.

Spartan League.—Chesham U., 6; R.A.F., Uxbridge, 1.

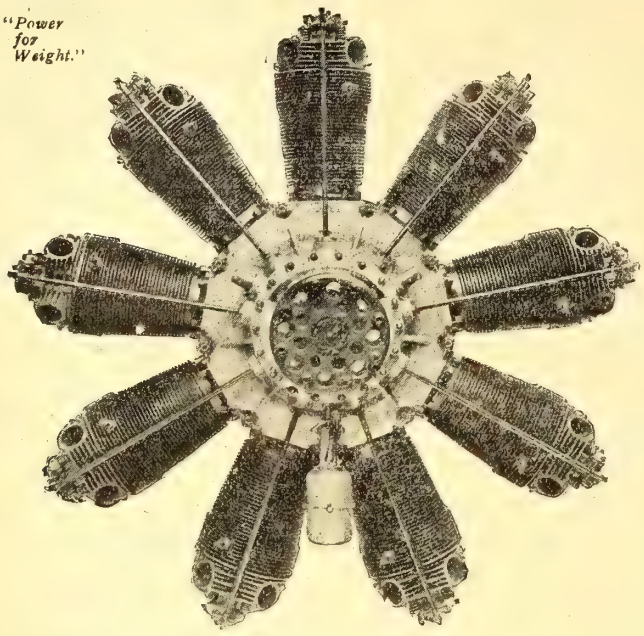
RUGBY.

The R.A.F. this season are only playing eight matches. Fixtures have been arranged against the Harlequins, Leicester, Northampton, Blackheath, Cambridge University, and Llanelly, finishing up with the Navy and Army in February and March of 1921.

The team do not begin playing until after Christmas. The R.A.F. is much more settled this year, and it is to be hoped that the team will be better than last year.

The team is captained by W. W. Wakefield, with R. H. C. Usher (a cousin of Scotland's captain last year), who is playing for the London Scottish, as vice-captain. As far as can be seen, G. H. Maxwell, last year's Scottish International, will be available. Also G. M. Thomas and W. C. Hicks, who are playing regularly for Leicester, will also be available. The forwards should be strong, but it is noticed that the backs will be again very weak, especially on the wings, where there is not enough speed.

A Cup Competition similar to that run by the Army has been instituted, for which already there are about 15 entries.



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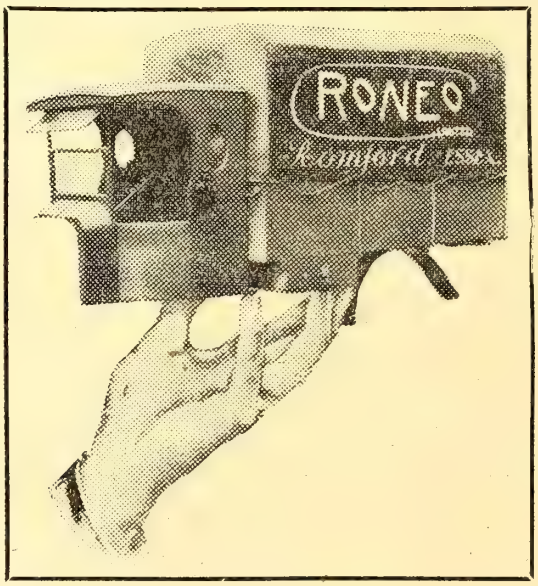

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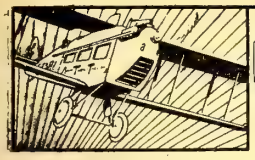

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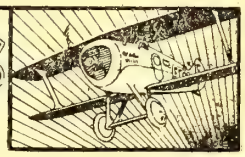

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.
OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIRMEN.

No. 120, Nov. 9th, 1920.—Denmark: Flying over Danish Waters.
No. 124, Nov. 15th, 1920.—Aerodrome List Amendments
No. 125, Nov. 17th, 1920.—France: Nimes Aerial Lighthouse; Toulouse Customs Aerodrome.
No. 126, Nov. 17th, 1920.—Holland: Aerodromes, Seaplane Station, Customs, etc. Describes position of aerodromes, seaplane stations, Customs, dangerous and forbidden areas, etc.
No. 127, Nov. 17th, 1920.—Penshurst Landing Ground: Provision of Wind Indicator
No. 128, Nov. 17th, 1920.—Biggin Hill Aerodrome Obstruction.
No. 129, Nov. 18th, 1920.—Manchester Aerodrome Obstructions.

THE AIR MAILS.

The Postmaster-General announces that the 09.30 air mail to Paris has been discontinued. The morning air mail on Fridays has hitherto afforded an opportunity of late posting, especially in the provinces, for the outgoing Thursday night mail for Egypt, Aden, and East Africa, India, etc., and, in some weeks, Australia. The same facility will be afforded in future by the Friday afternoon air mail, for which, in London, letters can be posted in public letter-boxes until the last collection on Thursday night, or handed in at the General Post Office up till 11.30 on Friday morning, and at corresponding times at certain other offices. The times will shortly be revised.

AIR MAILS TO PARIS AND THE EAST.

The Postmaster-General announces that on and after Thursday 25th the afternoon air mail to Paris will leave Croydon Aerodrome at 12.30 instead of 13.00. The latest times of posting for this mail will be altered in consequence, and will be as follows:—

(a) Unregistered letters handed over the counter at West Central District office, 11.05; General Post Office, 11.00; Threadneedle Street, Lombard Street, and Charing Cross branch offices and Western District office, 10.45; South-Western District office, 10.40; Parliament Street branch office, 10.25; South-Eastern District office, 09.00. Registered letters must be handed in five minutes earlier in each case.

(b) Letters posted in public letter-boxes:—District offices (other than those given above), 08.30; larger branch offices in East Central District, 09.00; sub-districts, 22.00 to midnight.

In the provinces it will be necessary to post earlier than hitherto only at some places in the south-east of England. Information should be sought from the local postmaster.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

NOVEMBER 15th:

NIL.—(Fog All Along Route.)

NOVEMBER 16th:

A.T.T., DH18, G-EAUF, London-Paris, 13.07-1525, G.&M., 5, Holmes.
I.A.L., "Bat," G-EAPK, London-Paris, 13.55-16.25, G., Nil, Chattaway & 1.
G.E.A., "Goliath," F.GEAD, Paris-London, 12.50-16.30, G., Nil, Labouchere & 1.
M.A., Breguet, F-CMAF, Paris-London, 12.50-1620, G.&M., 2, Challoux.
A.T.T., DH16, G-EALM, Paris-London, 13.05-15.50, G., Nil, Carter.

NOVEMBER 17th:

G.E.A., "Goliath," F-HMFU, London-Paris, 11.40—, G., Nil, Favreau & 1.
A.T.T., DH16, G-EARU, London-St. Inglevert, 12.50-14.00, Nil, 3, Reeves.
A.T.T., DH16, G-EAQS, St. Inglevert-London, —12.35, Nil, Nil, Milnes.
A.T.T., DH16, G-EARU, St. Inglevert-London, —11.23, Nil, Nil, Reeves.

NOVEMBER 18th:

M.A., Breguet, F-CMAF, London-Paris, 12.25-16.15, G., 2, Challoux.
G.E.A., "Goliath," F-GEAD, London-Paris, 13.00-16.25, G., 1, Favreau & 1.
A.T.T., DH9, G-EAOZ, London-Paris, 13.10-16.05, M., 2, Forson.
A.T.T., DH16, G-EALU, London-Paris, 13.10-16.05, G., 2, Robins.
A.T.T., DH16, G-EASW, London-Paris, 13.10-16.24, Nil, 3, Carter.
G.E.A., "Goliath," F-GEAB, Paris-London, 13.00-15.21, G., Nil, Patin & 1.
M.A., Breguet, F-CMAI, Paris-London, 13.04-15.33, G., 3, Martel.
M.A., Breguet, F-CMAC, Paris-London, 13.12-1532, G.&M., 2, Le Men.
A.T.T., DH9, G-EAQP, Paris-London, 13.06-15.10, G., Nil., Bamber.
A.T.T., DH18, G-EAUF, Paris-London, 13.08-15.05, G., 4, Holmes.
I.A.L., "Bat," G-EAPK, Paris-London, 13.10-15.10, G., Nil, Chattaway & 1.

NOVEMBER 19th:

M.A., Breguet, F-CMAC, London-Paris, 12.42—, G.&M., 2, Le Men.
M.A., Breguet, F-CMAI, London-Paris, 12.45—, G., 1, Martel.
G.E.A., "Goliath," F-GEAB, London-Paris, 12.50—, G., 1, Patin & 1.
A.T.T., DH16, G-EARU, London-St Inglevert, 13.10-14.10, Nil, 4, Lines.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 11.55-14.45, M., 2, George

NOVEMBER 20th:

A.T.T., DH16, G-EALM, London-Paris, 13.51-16.20, G., Nil, Tebbit.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 14.23—, M., Nil, George.
M.A., Breguet, F-CMAG, Paris-London, 11.45-14.00, G., Nil, Challoux.
G.E.A., "Goliath," F-HMFU, Paris-London, 12.25-15.29, G., Nil, Favreau & 1.
H.P.T., HP, G-EAMA, Paris-London, 12.33-15.10, G., 5, Bager & 1.
A.T.T., DH16, G-EALU, Paris-London, 13.07-15.10, Nil, 4, Robins.
A.T.T., DH9, G-EAOZ, Paris-London, 13.12-15.15, Nil, 2, Duke.
A.T.T., DH16, G-EASW, Paris-London, 13.13-15.11, G., 2, Forson.
M.A., Breguet, F-CMAB, Paris-London, 13.14-15.10, G.&M., Nil, Le Sec.

NOVEMBER 21st:

A.T.T., DH16, G-EALM, Paris-London, 13.10-15.09, G., 2, Carter.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

NOVEMBER 16th:

H.P.T., HP, G-EAMA, London-Paris, 11.42-14.50, G., 8, Beal & 1.
H.P.T., DH4a, G-EAVL, London-Brussels, 12.42-14.30, G.&M., 1, Foot.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 11.55-15.00, G.&M., Nil, Rigaud.
H.P.T., DH9, G-EAUN, Paris-London, 14.15-16.55, Nil, 2, Hope.

NOVEMBER 17th:

H.P.T., HP, G-EATL, London-Paris, 11.40, landed Beaumont (Paris 12.20 18th), G., 5, Bager & 1.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 12.50-14.45, G.M., Nil, Rigaud
H.P.T., DH4a, G-EAVL, Brussels-London, 12.00-15.37, G.&M., Nil, Foot.

NOVEMBER 18th:

H.P.T., DH9, G-EAUN, London-St. Inglevert & Paris, 10.25-14.10 (Paris), Nil, 1, Olley.
H.P.T., HP, G-EATJ, London-Paris, 11.55-16.26, G., 7, Hope & 1.
H.P.T., DH4a, G-EAVL, London-Paris, 11.45-14.35, Nil, 2, Foot.
H.P.T., DH9, G-EATA, Paris-London, 11.25-14.40, Nil, 2, Fowler.
H.P.T., HP, G-EATG, Paris-London, 11.27-15.05, G., 4, Beal & 1.

NOVEMBER 19th:

H.P.T., DH9, G-EAUP, London-Brussels, 12.50-15.30, G.&M., 1, Fowler.

NOVEMBER 20th:

Cricklewood, thick fog. Machines from Continent landed at Croydon.

NOVEMBER 21st:

H.P.T., DH9, G-EAUI, London-Paris, 11.55-15.05, Nil, 2, Beal.

Air Port Statistics.

Owing to bad weather, mists and fogs prevailing during the past week, the air lines to the Continent have been badly hampered, but not to so great an extent as the ground transport services.

CONTINENTAL

MACHINES:			
	Croydon 35	Cricklewood 16	Total 51
PERSONNEL.—Passengers:			
	Croydon 51	Cricklewood 35	Total 86
Crews:			
	Croydon 44	Cricklewood 20	Total 64

INLAND.

MACHINES:			
	Croydon 46	Cricklewood 8	Total 54
PERSONNEL (including one member of Crew per machine):			
	Croydon 526	Cricklewood 16	Total 542
Grand Total Machines 105		Grand Total Personnel 692	

Inland Flying at Cricklewood.

Nov. 15th.—Nil.

Nov. 16th.—W. Beardmore & Co., Ltd., WB2 to Glasgow (Ward); A.T.T., Avro from Croydon return (Shaw); R.A.F., Bristol "Fighter" from Hawkinge return (Travers); Bristol "Fighter" from Northolt return (Gibbons).

Nov. 17th-20th.—Nil

Nov. 21st.—H.P.T., Sopwith "Pup" test (Clemson); B.E.2e test (Curtis); O/400 from Swanscombe (Rogers); O/400 from Croydon (Bager).

Inland Flying at Croydon.

Nov. 15th.—Nil.

Nov. 16th.—A.T.T., DH16 1 test (Forson); Avro to Cricklewood, return (Shaw).

Nov. 17th.—A.T.T., 1 Avro Lympne return (Lines); M.W.T.C., DH6, 1 test (Lovell).

Nov. 18th.—Nil.

Nov. 19th.—A.T.T., Avro, 1 joy-ride; A. V. Roe "Baby," Hamble return, 1 test (Hinkler & 1).

Nov. 20th.—A.T.T., DH9, 1 test (Milnes); I.A.L., "Vimy," 9 joy-rides 85 passengers (Chattaway); 1 test (Chattaway).

Nov. 21st.—I.A.L., "Vimy," 26 joy-rides, 307 passengers (Chattaway); H.P.T., Ltd., HP to Cricklewood (Bager).

The London Terminal Aerodrome.

Plenty of good work has been done at Croydon during the week. On the whole the weather has been good, but on one or two days has been very thick in France, a fact which interfered somewhat with the workings of the Air Lines.

The chief items of interest were the large crowd of people present on Sunday and the arrival of the two-seater "Baby" Avro.

One referred last week to a new Air Line running from Croydon This refers to Handley Page Transport, who are shortly going to operate from Croydon Aerodrome as well as Cricklewood, the idea being, as explained fully in another part of the paper.

Now that the cold weather has really started one hopes that the management of the Trust House will see fit to restore the stove in the first-class lounge. Hot pipes are very nice in their own way, but for those who are living at the aerodrome and spend evenings in the lounge, a stove is essential.

Further, it would seem to be a sound idea if the Air Ministry could provide some way for pilots and others to take exercise. It is most important for pilots to keep fit, and a fives court might possibly be provided at a cost not out of proportion to results. Another excellent form of exercise is called "Medicine Ball." One of these at the station would be a god-send. It is not possible to get up Rugger or hockey teams owing to the frequent and uncertain absences on duty.

A large number of machines came in on Saturday afternoon, including an O/400 Handley Page, which was warned by telephone not to proceed to Cricklewood owing to weather. Mr. Bager, who was the pilot, left for Cricklewood on Sunday afternoon.—G. D.

A. T. and T. Notes.

"9's," "16's" and "18's" have all been busy during the week. A special Avro was booked to Lympne and back.

Mr. Lines took the Napier-engined "16" G-EAKU to St. Inglevert on Friday, and, owing to lack of water in the radiator, he discontinued his flight near Swanley on the return journey. An enormous quantity of freight was brought over on Thursday.—G. D.

The Instone Air Line.

For the five-shilling joy-rides on Saturday 85 passengers were carried. On one occasion the "Vimy," which was being flown by Mr. Chattaway, collided with a pee-wit; the pee-wit was "written off." On Sunday morning 118 passengers were carried and in the afternoon there were 269, making a total for the day of 387, and for the week-end 472. One imagines that this is a paying proposition.

Owing to the crush in the enclosure, the exit, after passengers have had their flight, had to be made through the lower extrance below Mr. Glasson's house. It is proposed to erect a public enclosure from the Customs' barrier right down to the level crossing. This, if necessary, will hold 5,000 people.

One would like to say a word for the sporting way in which the personnel of the I.A.L. give up their week ends to carry on this excellent form of propaganda. By the way, one is told that the latest name for the "Vimy" is "The Dollar Princess," partly owing to the price of a flight in her and partly owing to the initials of the firm (S.I.) intertwined on the house flag, painted on the machine.

It would be an excellent scheme if a few R.A.F. machines—if any happen to be out from Kenley on Saturdays and Sundays—would come and do some trick flying in view of the spectators. The Bristol "Fighter" and the Avro, which came over on Friday, executed some of the prettiest flying one has seen since the Pageant, for commercial machines are not meant or allowed to be stunted.—G. D.

A Flight in the Baby Avro.

On Friday afternoon last Mr. Bert Hinkler brought the two-seater 35-h.p. Green-engined "Baby" Avro from Hamble to Croydon in order to fetch the ration of petrol due to A. V. Roe and Co. which was owing to them for the demonstration to the Air Conference. The journey to Croydon occupied 50 minutes, and for the complete trip less than 4 gallons of petrol were consumed, and therefore the "Baby" is proved to be the most economical vehicle of any kind for the errand.

While waiting for the petrol to be brought out, Mr. Hinkler took one for a short flight in the machine. The passenger sits in the same cockpit as the pilot and immediately behind him. There is plenty of room for legs and the view is excellent. Mr. Hinkler's weight cannot be far short of 10 stone and that of oneself is 12 stone. In spite of this, however, she got on the ground in about 50 yards and started to climb at angle that one would have thought steep for a Bristol "Fighter." One thought at first this was merely a "zoom," but she went on climbing like this to about 1,000 feet, when the pilot started doing vertical turns and dives. During all this steep climbing and climbing turns there was not the vaguest suspicion of a stall. One said to oneself, "One's damned if one can understand it" (one always addresses oneself as "one" when one has been with THE AEROPLANE for a short time).

The feeling of the machine with the little Green engine is exactly that of big, high-powered engine of 300 h.p. At the moment the machine is slightly tail heavy, so that when all the controls are left alone she merely climbs in a very steep right-handed spiral.

After a bit Mr. Hinkler came down low and played about among the haystacks and sheds, which proceeding, one noted, made hope run high in the breast of the ambulance driver. During a level straight run up the aerodrome the speed indicator showed 87 m.p.h., and one believes that this particular indicator is fairly truthful. Even when the engine is running all out conversation between pilot and passenger can be carried on more easily than in the average two-seater motor car. The machine landed at a speed which one usual associates with a "Long-horn" Maurice Farman.

After landing Mr. Hinkler at once loaded up with the tins of petrol and started off about 16.00 hrs. to Hamble, where he arrived after lighting-up time; but he tells one that he was on the lookout for P.C. Xox. He intends to bring it up to Croydon again this next week-end.

It seemed to one that this would be an ideal training machine for the R.A.F. The initial cost would be about one quarter of that of machines now in use and the cost of running would be even smaller. Beside which, the handling of the machine more nearly approaches to that of a Scout than does the standard Avro. Two or three squadrons of this type would be just the thing when the Territorial Air Force comes into being, besides which the fact of the machine being put into production would at once cause the price to drop, which would enable the machine to be bought by the average pilot who now has either a motor-cycle or small car.

As to the question of depreciation, it should be said that the engine in the machine is the ten-year-old one which recently took Mr. Hinkler to Rome and back, and which won the Aerial Derby Handicap in 1919 and was second in 1920.

The engine can be started by pulling over the airscrew with one hand and the machine can easily be wheeled about by one man.—G. D.

Stone-Throwing versus Circulation.

In the *Star* news-sheet of Oct. 19th a representative in describing Croydon Aerodrome stated that the aerodrome was within a stone's throw of Waddon Station.

While recognising the inherent danger in stone-throwing by those who submit their "net circulation" to hot-air treatment in glass-houses, one is bound to admit that the stone-throwing capacity of the *Star* must be equal to at least six times that of the *Evening News*.

The Goshawk's Voyage.

The following report has been furnished by Mr. J. H. James, the pilot of the Nieuport "Goshawk" (320-h.p. A.B.C. "Dragonfly") G-EASK, respecting his flight from Hendon to Villesauvage, in order to compete in the Gordon Bennett Cup Race held on Sept. 28th. Owing to the absence of a Customs official at Lympne Mr. James arrived too late to enter and thereby considerably lessened the chances of Great Britain winning the race.

"The machine left Hendon for Lympne on Sept. 26th. A landing was made at Marden owing to fog, but the flight was continued an hour later and Lympne was reached at 3.55 p.m.

"Here the machine was filled with petrol and oil, but was delayed from leaving for Le Bourget owing to there being no Customs officer on duty to give a clearance certificate. This was obtained at 6.20 p.m., too late to make Paris that evening.

"The trip was continued next day, Sept. 27th, at 2.30 p.m., and after three landings to fix bearings Le Bourget was reached at 4.45 p.m. On the 28th the machine was flown over to Villesauvage, arriving there about 11.30 a.m.

"(Signed) J. HERBERT JAMES."

Brooklands.

A Vickers "Vim," a "pusher" instructional machine, built on similar lines to the "gun-carrier," has been flying fairly frequently recently. Several of these machines have been ordered by the Chinese Government. The present machine shows few original features, and is being improved after each test flight. A "pusher" is a curious sight nowadays, but it is the only machine one has seen over Brooklands for about a fortnight. It is not a "cut-down" "Vimy," whatever its name might suggest. One understands that the "Viking III" is suffering an experimental shop change.—J. F. S.

Liverpool.

Over six months ago the Northern Aviation Club was formed in Liverpool and its progress since then has been spasmodic. Great difficulty was found in procuring rooms until the Overseas Club very generously offered their rooms for the meetings.

Things seem brighter for the future and propaganda has been started to stir up public interest and local enthusiasm. Entertainments for the members during the winter and the arrangements for flying in the summer are being pushed ahead so that by next season the Club should be a very live one.—R. M. D.

Sheffield.

At a meeting of the Dronfield Council attention was called to the extensive empty buildings at the Greenhill Aerodrome which could be utilised for housing purposes. Mr. Packard (Chairman) said there was the making of a perfect model village and it seemed to him so inconsistent asking authorities to build when all those buildings were lying idle.—B. A.

Woking.

The Martinsyde people seem very hopeful for the future, in spite of the presence of the receiver appointed by their bankers, who hold £100,000 in debentures on the works. It is confidently hoped that the period following their exhibition of motor-cycles at Olympia will bring large orders, and as the spring approaches the works will be actively engaged in satisfying the demands which the firm's agents have indicated will be forthcoming. There appears to be every prospect of a lucrative revival of trade for the firm, which will necessitate the employment of a large number of hands.

With regard to the aircraft side, it is emphasised that the fact that a small designing and drawing-office staff is being retained indicates that the firm are far from abandoning this branch of their activities, which is, in common with the other firms in the industry, at a low ebb. Nevertheless, inquiries are continually being received from abroad for machines.

Encouraging reports have been received from Lieut. R. H. Nisbet (late R.A.F.), who has been for the past three months in Canada supervising the development of aviation there, particularly the use of aeroplanes in surveying forest regions. Good results have been obtained with two "A" type seaplanes, which are flown from the Great Lakes.—J. F. S.

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

The next meeting of the Society will take place on Thursday, Dec 2nd., at 5.30 p.m., at the Royal Society of Arts, John Street, Adelphi, when Air Marshal Sir Hugh Trenchard, K.C.B., D.S.O., will take the chair. Abstracts of two papers will be read: "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C., and "Airship Mooring," by Flight Lieut. F. L. C. Butcher, R.A.F.

The following meeting will be on Dec. 16th, when Mr. H. Ricardo will read an abstract of his paper on "Possible Developments in Aircraft Engines," to be followed by a paper by Mr. A. J. Rowledge on "The Installation of Aeroplane Engines."

ANNUAL DINNER.

At the annual dinner held at the Connaught Rooms on Nov. 17th, 137 members and guests were present. After the Royal toasts the Marquess of Londonderry, K.G., Under Secretary of State for Air, proposed "The Royal Aeronautical Society," to which the Right Honourable the Lord Weir of Eastwood, President, responded. The toast of "The Guests" was proposed by Major-General Sir R. M. Ruck, K.B.E., C.M.G., Sir Alfred Keogh responding.

EXAMINATIONS COMMITTEE.

The regulations for the examination of applications for Associate Fellowship prepared by the Examinations Committee were approved by the Council at their meeting on Nov. 16th, and the Committee is now proceeding with the drawing up of a syllabus.

ELECTION OF MEMBERS.

The following members were elected in the various grades as shown:

Associate Fellows.—Sqdr. Ldr. J. T. Babington, D.S.O., Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., Lieut.-Col. V. C. Richmond, O.B.E., and W. Sydney Smith, Esq., B.Sc.

Students.—N. Comper, Esq., Flying Officer C. J. Sims.

Members.—Wing Cmdr. M. G. Christie, C.M.G., D.S.O., M.C., Flt.-Lt. O. Vickers.

Foreign Members.—C. L. Egtvedt, Esq.

SCOTTISH BRANCH ELECTIONS.—Associate Fellows.—J. L. Bartlett, Esq., A. J. Campbell, Esq.

VICE-PRESIDENT.

At the Council meeting held on Nov. 16th, Major-General Sir R. M. Ruck, K.B.E., C.M.G., was elected a Vice-President in recognition of his valuable work on the Society's behalf over a period of many years, during eight of which he occupied the chair.

Nov. 20th, 1920. W. LOCKWOOD MARSH, Secretary.

THE ROYAL AERO CLUB.

COMMITTEE MEETING.

A meeting of the Committee was held on Wednesday last, Nov. 17th, 1920, when there were present Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair, Major-General Sir Sefton Brancker, K.C.B., Mr. Ernest C. Bucknall, Lieut.-Col. F. K. McClean, Lieut.-Col. Mervyn O'Gorman, C.B., Group-Captain C. R. Samson, C.M.G., D.S.O., R.A.F., and the Secretary.

ELECTION OF MEMBER.—The following new member was elected:—Sub-Lieut. Edward Cecil Selwyn Savill, R.N.R.

FEDERATION AERONAUTIQUE INTERNATIONALE.—It was reported that the Bureau of the Federation Aeronautique Internationale would meet in Paris on Jan. 10th next. It was decided to defer sending in the items for the Agenda until the Joint Standing Committee of the Club and the Society of British Aircraft Constructors had fully considered the proposals for next year's Schneider Race and the Speed Race to replace the Gordon Bennett Race.

The conditions for the Federation Aeronautique Internationale Superior Brevet were considered.

CLASSIFICATION OF MACHINES.—It was decided that the Racing Committee should formulate the Club's suggestions for the classification of machines for racing purposes.

AVIATORS' CERTIFICATES.—7904, Francis Reginald Alford; 7905, William Richardson Bailey. AERONAUT'S CERTIFICATE.—276, John William Havers. AIRSHIP PILOT'S CERTIFICATE.—66, John William Havers.

RACING PROGRAMME, 1921.

The Joint Standing Committee of the Royal Aero Club and the Society of British Aircraft Constructors meet on Thursday, the 25th inst., to consider the Racing Programme for 1921 and also the Regulations for the Schneider Race.

SERVANTS' CHRISTMAS FUND.

The Subscription List for this Fund is now open.

NEW COMPANY.

H. G. HAWKER ENGINEERING CO., LTD. (171,409).—Private company. Registered Nov. 15th. Capital, £20,000 in £1 shares. To acquire from F. I. Bennett all the patents, rights, etc., relating to the manufacture of motor bicycles, and to carry on the business of manufacturers of and dealers in cycles of all kinds, internal combustion and steam engines, motor cars, aircraft, etc. The first directors are: F. I. Bennett, 19, Cadogan Road, Surbiton, engineer; H. G. Hawker, "Ennadale," Hook Road, Surbiton, aeroplane pilot; T. O. M. Sopwith, Horsley Towers, Surrey, engineer; F. Sigrist, Torrington House, Wolsey Road, East Molesey, engineer; V. W. Eyre, Honeyhanger, Hindhead, Surrey, engineer. Qualification £500. Sec.: F. I. Bennett. Registered office: Canbury Park Road, Kingston-on-Thames.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

DEATHS.

HOBBS.—Harry Albert Hobbs, late Lieut. R.A.F., died at Bournemouth on Oct. 10th.

PRENTICE.—At Rochester, on Oct. 2nd, Major W. P. Prentice, A.I.D., son of S. Prentice, of Stowmarket, Suffolk, after a short illness.

RICHARDSON.—Capt. Gurth Alwyn Richardson, R.A.F. (Wireless Section), who was killed in Ireland on Oct. 10th, was the second son of the late T. W. Richardson, M.R.C.S.Eng., and Mrs. Richardson, Eaton Cottage, Norwich. He was 30 years of age.

ENGAGEMENTS.

HALSE—SPOONER-LILLINGSTON.—A marriage is arranged, and will take place in December, between Stanley Seward Halse (late Major, R.A.F.), second son of the late H. E. Halse, of Carnarvon Estate, Halseton, South Africa, and Ethel Loveday, younger daughter of Mr. and Mrs. G. B. Percy Spooner-Lillingston, of 5, Leigham Terrace, Plymouth.

KEDDIE—NAISH.—The engagement is announced between Capt. G. Douglas F. Keddie, late R.A.F., youngest son of Mr. G. J. Keddie, Hintlesham, Westcliff-on-Sea, and Hilda, only daughter of Mr. and Mrs. F. W. Naish, of Crowstone Road, Westcliff-on-Sea.

POTTER—THOMAS.—The engagement is announced between John R. Potter, late Major, R.A.F., elder son of Canon and Mrs. Hasloch Potter, of Surbiton, and Jessica Thomas, widow of Owen R. Thomas, and only daughter of Mr. and Mrs. Wilson Cruttwell, of 5, Oak Hill Road, Surbiton.

SCOTT—CAMERON.—A marriage has been arranged, and will shortly take place, between Group Capt. A. J. L. Scott, C.B., M.C., A.F.C., R.A.F., and Edith, widow of Cyril Cameron, R.H.A.

SPENCER-LEWIN—HUGHES-MORGAN.—The engagement is announced of Capt. Brian Alexander Spencer-Lewin, R.A.F., son of Lieut.-Col. and Mrs. Spencer-Lewin, of Ifield, Sussex, and grandson of the late Mr. J. P. A. Lloyd-Philipps, J.P., D.L., of Dale Castle, Pembrokeshire, to Violet, eldest daughter of Sir David and Lady Hughes-Morgan, of Penally House, Penally, Pembrokeshire.

THORN—HARDY.—The engagement is announced between Robert N. Thorn, eldest son of Mr. and Mrs. Charles Thorn, of Heathfield, Tiptree, Essex, and Frances E. C. Hardy, of Beechwood, Farnborough, Kent, widow of Lt. Jack Hardy, R.A.F., and daughter of Mrs. Goodall, Greycroft, High Lane, Cheshire.

YUILLE—MERRICK.—The engagement is announced between Capt. A. B. Yuille, D.F.C., elder son of Mr. and Mrs. Herbert Yuille, of Harescombe, Northwood, Middlesex, and Audrey Violet, elder daughter of Lieut.-Col. and Mrs. William Merrick, of 22, Sheen Gate Gardens, East Sheen, S.W.

MARRIAGES.

BENN—HOLMES.—On Nov. 17th, at St. Margaret's, Westminster, Captain Wedgwood Benn, D.S.O., D.F.C., M.P., was married to Margaret, daughter of Mr. D. T. Holmes, formerly M.P. for Govan, and granddaughter of Provost Eadie, of Paisley. The Bishop of London officiated.

BISHOP—DAVIES.—The marriage of Flight Lieut. Alan G. Bishop, A.F.C., R.A.F., and Miss Vanda Pamela Davies took place at St. Saviour's Church, Brockenhurst, Hants, on Nov 6th, from Walden, Brockenhurst.

CANNON—BLACKBURNE.—On Sept. 6th, very quietly, at St. Paul's, Knightsbridge, S.W., S. Laurence Cannon, R.A.F., Castlebar, Co. Mayo, was married to Joan Mary Ireland Blackburne, East Looe House, Canford Cliffs, Dorset.

CARROTHERS—GODBER — On Aug. 31st, 1920, at St. Giles', West Bridgford Parish Church, William Alexander Carrothers, B.A., D.F.C., C de G., Edinburgh, was married to Agnes Elizabeth, eldest daughter of the late Percy J. Godber, of Radcliffe-on-Trent, and of Mrs. P. J. Godber, 17, Musters Road, West Bridgford, Nottinghamshire, by the rector, the Rev. Richard Hargreaves, M.A.

CARTER SOUTHARD.—On June 9th, at St. Stephen's Church, Calgary, Alberta, Canada, Capt. Alfred William Carter, M.B.E., D.S.C., was married to Gwendolyn Kathleen, daughter of Mr. and Mrs. Archelaus Southard.

CAVE—PIGGIN.—On Oct. 30th, at the Chapel Royal, Savoy, Flying Officer Thomas Walford Cave, M.C., R.A.F., was married to Gwendoline Mary Piggin, only child of Herbert Harry and Mrs. Piggin, Eastbourne, by the Rev. T. S. Cave, father of the bridegroom.

DAVIES—MONTGOMERY.—The marriage took place on Sept. 29th, at the Parish Church, Alnmouth, of Commander Richard Bell Davies, V.C., D.S.O., R.N., son of the late Mr. William Bell Davies, of Crosby Grange, Rickmansworth, and Mary, daughter of Major-General Sir Kerr and Lady Montgomery, the former of whom gave the bride away. Commander Brounger, R.N., was best man, and Canon Boot officiated, assisted by Canon Mangin and the vicar of the parish.

DUFFUS—HANSON.—On Nov. 13th, at All Saints' Church, Cairo, Flight-Lieut. James Logie Lyall Duffus, R.A.F., eldest son of James Duffus, M.D., J.P., and Mrs. Duffus, of Auchenblae, Kincardineshire, was married to Helen Vera Mary, fourth daughter of Mrs. Hanson and the late Arthur Stephen Hanson, M.R.C.S., L.R.C.P., M.D., of Titchfield, Hants.

ELLIS—BUCK.—On Oct 10th, at St. Barnabas Church, Cambridge, Flying Officer H. C. F. Ellis, R.A.F., C.P.O., Woking, only son of Mr and Mrs. H. J. Ellis, of Cambridge, was married by licence to Florence Eveline, third daughter of Mrs A. Buck, Hemingford Road, Cambridge.

EVILL—KLEINWORT.—The marriage between Sqdn. Leader D. C. S. Evill, D.S.C., R.F.C., and Miss Henrietta Kleinwort, younger daughter of Sir Alexander and Lady Kleinwort, took place on Oct. 8th, at Christ Church, Down Street, at 2.30 p.m.

GODFREY—MALLAM.—On Nov. 15th, at the Parish Church, Hayes, Kent, Reginald William Godfrey, Indian Police, late R.F.C., son of Mr. and Mrs. J. W. Godfrey, of Barkingside, was married to Audrey Sheila, daughter of Mr. and Mrs. Crosland Mallam, of Heathfield, Keston, Kent.

GOODFELLOW—MACKEY.—At Morpeth Parish Church, on Sept. 2nd, Charles Goodfellow, late R.A.F., eldest son of Mr. and Mrs. A. J. Goodfellow, of Ealing, and Mary, youngest daughter of the late Jefferson and Mrs. Mackey, of South Shields.

HORSFIELD—MUIR.—The marriage took place on Oct. 6th, at the Brompton Oratory, of Capt. H. T. Horsfield, R.A.F., son of Mr. and Mrs. Thomas Horsfield, of Evesham, Worcestershire, and Lily, daughter of the late Julius Muir, Indian Civil Service, and Mrs. Muir, of 33, Trevor Square, Knightsbridge. The Rev. Father Lewis Woodruff officiated.

JAMEISON—PIGOTT.—At Christ Church, Mussooree, India, on July 12th, 1920, Capt. J. W. E. Jameison, I.A., and late R.A.F., was married to Gwendoline Victorie Pigott by the Rev. D. L. C. Dunlop.

KLAPPER—DOWN.—On Oct. 23rd, at St. George's, Hanover Square, Flying Officer J. F. A. Klapper, R.A.F., was married by special licence to Gladys, only child of Mr P. A. Down, M.I.M.E., and Mrs. Down, of St. Dunstan's, East Sheen, Surrey.

MADDOCK—MABY.—On Oct. 9th, at St. Stephen's, Dulwich, Lieut Robert Alexander Maddock, R.A.F., eldest son of Mr. and Mrs. Robert J. Maddock, "Springfields," Alsager, Cheshire, was married to Lily Amelia Margaret, eldest daughter of Mr. and Mrs. W. H. Maby, Upper Norwood, London, by the Rev. W. F. James.

SINNATT—RANDALL.—On Sept. 25th, at St. Deny's Parish Church, Sleaford, Oliver Sturdy Sinnatt, M.C., D.Sc., M.Sc., Professor of Aeronautical Science, R.A.F. Cadet College, Cranwell, was married to Marjorie Helen, only daughter of Mr and Mrs Randall, of Bridgend, Glamorgan, by the Rev. Canon Langdon.

THOMAS—ABBOTS.—On Sept. 27th, at Trinity, Park Street, Swansea, Flight Lieut. T. J. Thomas, R.A.F.M.S., the eldest son of Mr John Thomas, Swansea, was married to Mary, the only daughter of Mr and Mrs J. Abbots, Edgbaston, Birmingham, by the Rev. Lodwy Lewis and the Rev. T. E. Davies.

WYATT—RICHARDS.—At All Saints Church, Cairo, Sept. 2nd, Obs. Officer M. J. Wyatt, M.C., R.A.F., was married to Valerie, eldest daughter of Mr. and Mrs. E. G. R. Richards, of Newport, Mon., by the Rev. P. R. C. Lamb, Deputy Chief Chaplain, R.A.F., Middle East.

BIRTHS.

BALL.—On Oct 3rd, to Ivy Clara, wife of L. P. Ball, O.B.E. (late R.A.F.), at Sunnyside, Bray-on-Thames, a daughter.

BEDDOW.—At Shanghai, on Sept. 18th, Capt. L. T., late Devonshire Regiment and R.A.F., and Mrs. Beddow, late Deputy Administrator, W.R.A.F., of a son.

BIRD.—On Oct. 14th, at Culford, The Avenue, Chingford, to Mary Eveline, wife of Lieut. A. H. Bird, late R.F.C. and R.A.F., a son.

COMPSTON.—On Sept. 26th, 1920, at 16, Castletown Road, W.14, the wife of Flight Lieut R. J. O. Compston, D.S.C., D.F.C., R.A.F., of a daughter.

DE ROEPER.—On Oct. 1st, to Jean (*nee* Key), wife of Sqdn. Ldr. B. P. H. de Roeper, A.F.C., R.A.F., of Upminster, Essex—a daughter.

DURRANT.—On Nov. 9th, to Hilda May (nee Brett), wife of Flying Officer R. F. Durrant, A.F.C. (late H.M.A. R.34), of Braemar, Tee-on-Solent, a son.

EDMONDS.—On Oct. 5th, at 69, Vincent Square, London, S.W.1, to Lorna (*nee* Osborn), wife of Sqdn. Ldr. C. H. K. Edmonds, D.S.O., O.B.E., R.A.F.—a son.

HAWARD.—On Sept. 19th, at Balfour Brechin, Forfarshire, N.B., to Margaret Edith, the wife of Reginald Stanley Haward, late R.A.F.—a daughter.

HULL.—On Sept. 23rd, at 14, Windsor Terrace, Sliema, Malta, Beatrice, the wife of Flying Officer H. C. Hull, of a son.

LAPRAIK.—On Oct. 22nd, at a nursing home, to Winifred (née Nix), wife of Capt. D. F. Lapraik, D.F.C., late R.A.F., of Trouville, High Beach, Lindfield, Sussex—a daughter.

MACKENZIE.—On Oct. 9th, at Rusholme, Alverstoke, Christabel, wife of Flight-Lieut. A. H. MacKenzie, A.F.C., R.A.F., of a daughter.

MANSEL-LEWIS.—On Oct. 11th, at 41, Walters Road, Swansea, to Muriel, wife of Captain A. Mansel-Lewis, A.F.C., Cliff Cottage, Pembrey, S. Wales, the gift of a son.

MAXWELL.—On Oct. 24th, at 14, Hollycroft Avenue, Hampstead, the wife of Flight Lieut Reginald Stuart Maxwell, M.C., D.F.C., R.A.F.—a daughter.

MEDHURST.—On Sept. 26th, at Fulford Vicarage, York, the wife of Flight Lt. C. E. H. Medhurst, O.B.E., M.C., R.A.F., of a daughter.

MERTON.—On Oct. 8th, at Slopes, Woldingham, Surrey, to Mary (*nee* Crowley), wife of Major Gerald Merton, M.C., late R.A.F.—a son.

NIGHTINGALE.—On Oct. 30th, at Pembroke House, Felixstowe, to Stella (née Whitaker), wife of Flight Lt. A. J. Nightingale, R.A.F.—a daughter.

SHIELD.—On Nov. 15th, at Watford, to Nora, wife of Flight Lieut. H. S. Shield, M.C., a daughter.

TOLFREE.—On Oct. 2nd, at Camelot, Guildford, to Freda (nee Nash), wife of Lieut. W. N. Tolfree, R.A.F.—a son.

TRAVERS.—On Sept. 27th, at Five Elms, Hayes, Kent, the wife of Benjamin Travers A.F.C., (late R.A.F.) of a son.

WINFIELD-SMITH.—On Nov. 2nd, at "The Gables," Great Chesterford, Essex, the wife of Sqdn. Ldr. S. C. Winfield-Smith, D.S.O., R.A.F.—a daughter.

[With Compliments to the First British Soldier wounded in the Great War.—Ed.]

COMING EVENTS.

DECEMBER.

1st, Wed.—Westgate-on-Sea Seaplane Base and R.A.F. Manston Dinner at Holborn Restaurant. Particulars from Mr. T. S. Setterfield, 1, Cuthbert Road, Westgate-on-Sea.

2nd, Thurs.—R.Ae.S. lecture "Airship Mooring," by Flight Lt. F. L. C. Butcher, and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.* | Chairman, Air Marshal Sir Hugh Trenchard.

11th, Sat.—Armament School, Uxbridge. Dinner at Holborn Restaurant at 7.15. Hon. Sec. at 32, Old Jewry, E.C.

27th Sqd. Dinner at Criterion Restaurant. Particulars from Mr. E. L. Raworth, Lenzie House, East Parade, Harrogate.

104 Sqdn. Reunion Dinner at the Connaught Rooms, W.C.2. Particulars from Mr. C. G. Jenyns, Services Club, W.1.

16th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Installation of Aeroplane Engines," by A. T. Rowledge.*

18th, Sat.—Felixstowe Air Station Reunion Dinner at the Connaught Rooms, W.C.2, at 7 p.m. Particulars from Mr W. Kitson, 22, Manor Terrace, Felixstowe.

JANUARY—1921

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S. lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr H. W. S. Outram.*

17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m.

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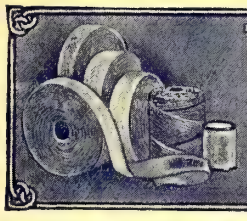

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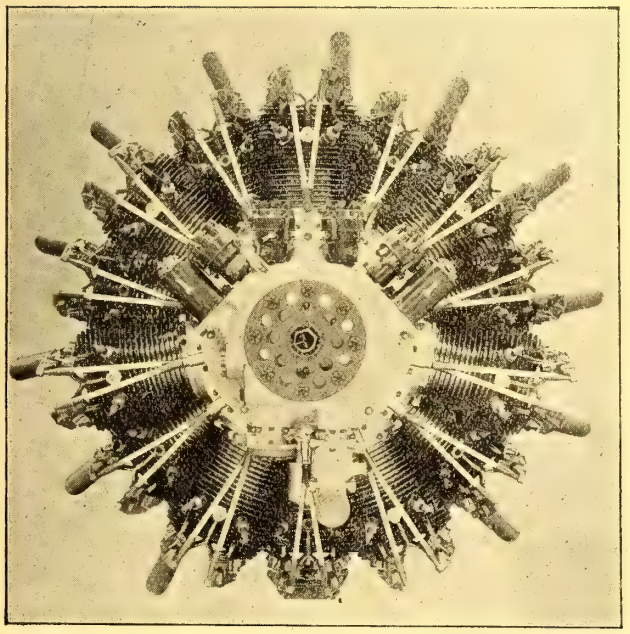

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ON A MATTER OF EFFICIENCY.

In the days of one's comparative youth, when the late Walter Staner, the wisest of all editors of technical newspapers, made *The Autocar* the ruling power in the automobile trade, one was instructed by him that if one wanted to achieve a certain object, or to effect a certain reform, the way to do it was to say what one wanted to say, and keep on saying it till people ended by being convinced, but that one must keep on saying it in different ways.

Somehow this excellent piece of philosophy reminds one of the retired Thomas Atkins who wanted to telephone to Ealing, and was asked by the young person at the other end of the line to repeat the name of the exchange. Mr. Atkins, being more or less accustomed to Army methods, proceeded thus :—"E-A-L-I-N-G. E, for 'Erbert; A, wot 'orses eats; L, w'ere yer goes w'en yer dies; I, wot yer says w'en yer wants a taxi; N, wot lays eggs; G, for Gorblimey. 'Ave yer got it?" And he was given his number.

Without pretending to the ingenuity of Mr. Atkins in achieving one's objects, one recognises the soundness of the policy of saying the same thing over again in different ways, so that ultimately people may see the truth. For, true as it is that the best way of extracting wit from a Scotsman is with a corkscrew, it is still truer that the best way of getting sense into an Englishman is with a hammer. Consequently, if the more intelligent readers of this paper do find the same arguments cropping up over and over again in different forms, they will know why. And they will understand that it is done for the benefit of their less enlightened fellow-countrymen.

The Navy and the R.A.F.

For instance, there is that old, old question as to whether the Navy ought to be allowed to handle anything concerned with the Air. Or, rather, whether any of the personnel and material of the R.A.F. ought to be handled by the Navy. There are still many who think that the Navy ought to have its own Air Service and should be allowed, in the words of Mr. Kipling's admiral, to "conduct its own manœuvres in its own damned tinker fashion."

A priceless example of the British Naval brain is provided by Rear-Admiral William Sowden Sims, U.S. Navy, in his recently published book, which he calls, with possibly unconscious humour, "The Victory at Sea." Admiral Sims and some assorted ships came to Europe to help the Royal Navy (plus the navies of the rest of the twenty-two Allies) to defeat Fritz, of the Hun Submarine Service. He tells how, early in 1917, Admiral Jellicoe showed him a secret paper showing the total losses of tonnage during the previous few months.

Says Admiral Sims :—"I was fairly astounded, for I had never imagined anything so terrible," and he remarked, "It looks as though the Germans were winning the war." To which Admiral Jellicoe—the bright particular star of the British Navy—replied, "They will win unless we can stop these losses, and stop them soon." Admiral Sims asked, "Is there no solution for the problem?" And the C. in C., Grand Fleet, replied, "Absolutely none that we can see now."

That, be it noted, was in 1917, when any one of some dozens of quite ordinary young men in the R.N.A.S. could have provided an assortment of solutions for the problem, most of which would have been of some practical use, and would have included the operations of airships, seaplanes, and kite balloons. Yet at that date aircraft of all kinds were regarded by senior Naval officers with that impenetrable contempt which the fossilised brain always has for anything new proposed by young men.

A year later the Navy was still losing ship after ship which it was supposed to be escorting through the danger zones. For months, at the end of 1917 and the beginning of 1918, never a convoy got across the Mediterranean with Naval escorts without losing one or more of its ships. And during those same months never a convoy equipped with R.N.A.S. kite-balloons was so much as attacked in those same danger zones. Similarly in home waters, the aerial escorts hardly ever, if ever, lost a ship of their convoys, while the Naval escorts went on losing steadily till nearly the end of the war—in spite of the assistance of Admiral Sims and his merry, if dry, men.

Of course, the defenders of the Navy will argue that Admiral Jellicoe and most of the senior N.Os. of 1917 are now back numbers, and that the War Staff at the Admiralty, as now constituted, is of quite different calibre. Possibly that is so, though Admiral Chatfield's contribution to the Air Conference distinctly conveyed the impression that his views on Naval Aeronautics are some four or five years behind the times. But whatever the Naval War Staff may be, the Admiralty as a whole seems to have advanced little since the days of Lord Nelson. In fact one might fairly say that it has not advanced in its methods since Mr. Samuel Pepys observed at Chatham Dockyard, "four great horses" hauling a piece of timber which could have been carried by two men.

A Naval Occasion.

If anyone doubts this let them inquire into an incident which occurred only a few months ago. Those enlightened people who control the Department of Supply and Research at the Air Ministry were then interesting themselves in the very important subject (to the Navy) of amphibian aeroplanes flying off the decks of aircraft-carrying ships. In order to give the designers of such aeroplanes full knowledge of the problems to be solved, a number of designers belonging to the leading aeroplane firms were invited by the Air Ministry to visit H.M.S. *Eagle*, an aircraft-carrier of the most recent type, so that they could see for themselves how their prospective machines would be stowed, and handled, and launched, and so forth.

The invited designers assembled at Victoria Station on the appointed day, to take train for Portsmouth, where *Eagle* was lying. One designer had travelled overnight from Leeds. Another had come up from Bristol. Others had come from outlying parts of London in the early morning. At Victoria they were met by officers from the Air House, with whom they co-operated on the most friendly terms, and there was every prospect of a highly educative day being spent, profitable not only to the designers and to the Air House officials, but ultimately to the Navy, for whose benefit the new aeroplanes were to be designed.

But, on the platform, the party was held up by an order, dispatched post haste from the Admiralty, that it was not to proceed, as no civilians would be permitted to board H.M.S. *Eagle* or to view her at close quarters. Consequently, the designers had to set to work to design amphibians to be carried on and flown from *Eagle*, without being allowed to acquire any exact knowledge of the conditions entailed, other than what they could gather from picture postcards of the ship, which were commonly on sale in Portsmouth, and from friends who had visited the ship unofficially at various times.

Now, could anybody except the Navy have been guilty of such a piece of abject imbecility as to forbid the ship to the very men who were to design her armament? Can anyone doubt, after such an example, that "dual control" of an aircraft-carrier must be as disastrous as Mr. Churchill has said, and proved, dual control of an aeroplane to be?

We have already had the *Ark Royal* affair to show how unfit the Navy is to handle aircraft-carriers abroad. The example related hereinbefore shows what foolishness the Navy can commit at home.

Obviously either the ships and their aircraft and their flying personnel must belong entirely to the Navy, in which case they will be equipped in a style five years at least behind the times, or the ships and all that is therein must belong to the R.A.F., in which case they will be thoroughly modern in their equipment, both mental and material. The latter plan has the advantage that the personnel of R.A.F. aircraft-carriers could then co-operate intelligently with troops ashore, which truly Naval aviators with a Naval training could never do, and they could co-operate when necessary with a Fleet in being at least as well as any Navy-trained aviators

If the Admiralty is determined not to let the aircraft-carriers belong to the R.A.F., then the best thing the Air Council could do would be to hand over the whole of the "Coastal Area" bodily to the Admiralty. All the best men would then elect to come out of it and join the R.A.F., and the Admiralty system would soon reduce the rest to the average level of intelligence of the Navy, which means about that of the Lower Fourth in a Public School.

Which means that in the next little coastal war the Admiralty would have to come to the Air Ministry for help, for it would soon find that its fondness for pushing seaplanes a hundred miles inland over mountains, as it has been doing lately in Asia Minor just as it did in Palestine five and a half years ago, would rapidly exhaust its supply of pilots.

A Ministry for War.

Then we should arrive somewhere near the proper solution of the whole problem—namely, the formation of a Ministry of Defence, with at its head a Secretary of State for War, who would have under him Under Secretaries for the Navy, the Army, and the Air Force. The scheme is one which Mr. Churchill has favoured for many years, and there is none better fitted than he himself to be the first War Minister, for he was an excellent First Lord of the Admiralty (apart from the fact that he and Prince Louis of Battenberg mobilised the Fleet before war was declared and so saved us from coastal raids and much heavy loss of shipping), he is primarily responsible for the fact that in the recent war we had any Flying Services at all, and he has proved himself during the past year to be at the same time an efficient and popular Chief at the War Office.

When we have the three Services under one head in this way it will then, and only then, be possible to co-ordinate the routine work of the Services so that they can co-operate efficiently in time of war. So long as the same words mean different things in the three Services, so long as different words mean the same thing, and so long as one Service cannot understand the various indent forms, operation orders, and so forth of the other, so long efficient co-operation is impossible. If Naval or Air Force people ashore do not know how to draw rations on Army forms, how can the men be fed and how can they do their work?—unless the Army feeds them out of sheer charity, and then probably the Navy would be rude about the quality of the food. And if a soldier attached to the R.A.F. does not know what or where a "mess-deck" may be, how is he to get his dinner?

Such things as these may seem trivial details, but as a matter of fact the co-operation of the three fighting Services depends on such details because an army, as Napoleon said and as Captain Bruce Bairnsfather illustrated, moves on its stomach. The stomach of the army, or mixed fighting force, of to-day and of the future includes the appetites of its mechanical adjuncts, such as aeroplanes, tanks, lorries, and other things, and its provender includes petrol, oil, sparking plugs and such, as well as bread, meat, and ammunition.

Hence the necessity for absolute co-ordination in the Q. and A departments of all three Services, as well as in the G. departments. And hence the need for one War Minister to oversee and control the lot.—C. G. G.

THE POST OFFICE AND THE AIR MAILS TO IRELAND.

Once again the Post Office has given evidence of its extraordinarily limited outlook towards the air mail question. On Nov. 23rd Mr. Illingworth, the Postmaster-General, moved in the House of Commons "That the contract, dated the 11th day of November, 1920, between the Postmaster-General and the London and North-Western Railway Company for the conveyance of His Majesty's mails between Holyhead and Kingstown from the 28th day of November, 1920, be approved."

For many years past the Irish mail contract has been held by an Irish company, The City of Dublin Steam Packet Company, running between Holyhead and Kingstown. During the war this company's ships were commandeered by the Navy, two of them were sunk, and the company has not been compensated for their loss by the Government. This state of affairs made it impossible for the company to obtain new ships and run an accelerated service, and the company is consequently closing down. This, of course, makes the mail contract a gift to that powerful English concern, the London and North-Western Railway.

Mr. Lindsay, one of the Members for Belfast, complained that there was little use in accelerating the steamboat service by half an hour when the train service between London and Holyhead and between Dublin and Belfast was hours slower than before the war.

Lieut.-Comdr. the Hon. J. M. Kenworthy, who displayed singular ignorance of the operation of mail steamship lines, showed distinct intelligence in another direction by asking the Postmaster-General "Whether any commercial air companies were invited to tender for the carriage of mails by air either now or in the near future." He added: "I am very much afraid the Post Office is not nearly so alive to the importance and practicability of carrying mails by air as other countries are and as they ought to be. Further," he said, "this contract provides a subsidy of £100,000 a year for 20 years for carrying the mails between these two Governments, and that subsidy would be of extraordinary value to an aircraft company or group of companies who could form a syndicate for the purpose. A subsidy which is a moderate one for shipping is a very great subsidy for aircraft, because, for the distance covered and the time, aircraft are infinitely cheaper than waterborne traffic. . . . It is a tremendous mistake if we have in any way bound ourselves in this contract to carry the mails by water for 20 years. . . . In a few years' time, if we are still bound for 20 years to carry these mails by the Holyhead sea route, we will be the laughing-stock of the world."

Aviation is certainly unfortunate in some of its friends. If anybody in the House other than Lieut.-Comdr. Kenworthy had made his speech it would very probably have carried considerable weight.

Lieut.-Col. Moore-Brabazon, who, occupying an official position as Parliamentary Under Secretary for Air, is naturally inclined to support the official view, said: "The whole question of air mails is a difficult one, because the aeroplane is not an efficient traveller at night, whereas the ordinary traffic across the sea goes on in the dark, and until we educate people to post their letters in the morning, which we shall never be able to do, then the evening service is as satisfactory a thing as one can get. In the London and Paris air service there is very little advantage. The needs of the community are met by the ordinary traffic."—Which is not an encouraging remark to come from one of the pioneers of aviation.

At the same time, Col. Brabazon is always outspoken in his views, hence also the following: "The whole question of air mails is one which concerns the general policy of the Postmaster-General. Are you to look upon the carriage of mails as purely a business proposition, or can you use the money voted for the Post Office indirectly to benefit the nation in other ways? We have been told recently by the military authorities, the Chief of the Air Staff especially, that an efficient Air Force must necessarily depend on efficient commercial aviation. Therefore it is to the national advantage to see that somehow commercial aviation in this country should flourish. At present nothing is being done to encourage it. Though there have been recommendations by advisory committees that there should be subsidies, these have not materialised, and in the present state of our finances I do not think they ever will. So commercial aviation looks to the Post Office as one of the few helps that it is ever likely to get."

Mr. Illingworth, in his reply, showed that lack of understanding of his subject which is unfortunately so common among political Ministers, and would undoubtedly bring our administration to an unhappy end if it were not for the intelligence of the permanent Civil Service officials of the various departments. Referring to Lieut.-Comdr. Kenworthy's speech, he said: "I can assure him that this is not being overlooked by the Post Office. Air mails are at present more or less experimental. There are now air mails to Paris, Amsterdam, and Brussels, but the atmosphere is more favourable for them. There is less cloud and fog than on the route from this country to Ireland. . . .

"Not only that, but I would remind the hon. and gallant Member that the essence of the Irish mail is that it should go by night. At present, of course, night-flying cannot be done. I know it was done during the war under exceptional circumstances, but it cannot be expected to be done now. . . . In case in the next 20 years the mail service by air becomes a practical proposition, there is provision made in this clause for making a corresponding reduction in the amount paid to the London and North-Western Railway Company for the fewer mails they carry."

OFFICIAL MISCALCULATIONS.

Both Mr. Illingworth and Col. Moore-Brabazon have failed to see, or have wilfully omitted to mention, one very important aspect of the question. It is entirely erroneous to assume that all letters to Ireland must necessarily go by the night mail. In the happy days before the war there was a morning mail train at 08.20 from Euston, from which passengers and mails arrived in Dublin at about 17.00 hours, and the letters were delivered in Dublin by about 19.00 hours. These letters were all those which were posted in London after about 17.30 hours the previous day, which meant practically all private correspondence with Ireland.

It is true that ordinary business letters are generally posted in time to catch the 20.40 mail train in the evening for

Holyhead. But all letters which are too late for that train—and that means practically all personal letters, for most people do their letter-writing in the evening—do not leave London till the 08.20 train the following day. Which apparently now takes so long that they are not delivered in Dublin the same day.

There is no reason whatever why letters in time for the night mail train should not go by the 20.40, but in addition there should be a day service by air mail to take all letters posted in the evening too late for the mail train. These letters would leave London by about 10.00 hours during the winter or by 06.00 in the summer and would arrive in Dublin by about 13.30 in the winter and about 09.30 in the summer, and so would be delivered in Dublin during business hours in either case. Similar services in the reverse direction would give business-men equal advantages.

Quite half the letters to Ireland would, one feels sure, go by air under such conditions. If the subsidy to the L. and N.W. Railway Company were cut down to £50,000 for the night mail service and the other £50,000 were paid to an aviation company for the day mail service it would then be possible for an aeroplane firm to run the day mails at any rate without losing money.

Mr. Illingworth is entirely wrong in stating that the atmosphere is more favourable on the cross-Channel lines than it is on the route from this country to Ireland It is possible that there may be more cloud and wind on the Irish route, but against that there is certainly very much less fog in the West of England than there is in France, the reason being that the climate is warmer towards the west and there is consequently very seldom that heavy morning fog after frost which is so common in France. One ventures this statement as the result of many years' residence in Dublin, and in Birmingham, which is practically on the air line between London and Holyhead, so one can claim to know considerably more about both the meteorological, the aeronautical, and the mechanical side of air-mail work than does Mr. Illingworth.—C. G. G.

AN APPOINTMENT.

It was announced on Nov. 24th that Wing Comdr. H.R.H. the Duke of York, K.C., R.A.F., has appointed Wing Comdr. Louis Greig, M.V.O., to be Comptroller to His Royal Highness.

ON TECHNICAL OFFICERS.

The attention of the more intelligent readers of this paper is directed to Captain Sayers' article on the future of the Technical Staff of the R.A.F., which appears on page 845.

Even the most unmechanically-minded pilot will realise that the safety of his own neck depends ultimately on the efficiency of the technical officers in the R.A.F. Probably any flying officer with a fair amount of intelligence and a liking for mechanical detail is capable of becoming a fairly effective stores officer or workshop officer in a squadron, but a very different class of intelligence is required for the Staff Officers of the Technical Department.

These have on the one hand to judge the value of machines submitted to them by designers and constructors as aeronautical engineering products, and on the other have to know enough about war aircraft to judge their value as war machines. Moreover, these Staff Officers have to know enough about both sides of aeronautics to command the respect of the technical and engineering officers in all departments under them. The problem of discovering such officers is discussed in considerable detail by Captain Sayers.—C. G. G.

AN AIRSHIP STATION.

It has been known generally in aviation circles for some time past that the Department of Civil Aviation has decided to take over some airships from the R.A.F. and use them as the nucleus of an air line. When it has been proved or disproved that the airship is a commercial proposition the Government will endeavour to hand the whole affair over to a commercial syndicate.

The present arrangement seems to be for Pulham to become the air station. It seems very unnecessary to make people go all the way to Pulham to catch an airship. The ideal terminal station seems to be the old military aerodrome at Croydon. This would have the effect of centralising the air traffic, and the existing Customs station could be used.

A mooring-mast would be erected over the far side of the ground from the sheds, and ships would anchor to this for embarking and disembarking passengers and goods. They could use Pulham as a sort of dry dock when necessary.

The chief crab to the scheme is the obvious danger of a high mast in the vicinity during fog or darkness. The latter danger would be eliminated by efficient lighting. As to fog, one is assured that the mast would not have to be very high, but it seems that it would be impossible to subject it to the same process as that applied to the poles from which the tarpaulin covering the Centre Court at the All England Lawn Tennis Club at Wimbledon is suspended.

It has been suggested that it would be possible to have a mast right in London for the purpose, but this at the moment would be undesirable.

Taking it all round, however, Croydon seems to be the best spot, and the Air Ministry should really take steps to acquire the old aerodrome before it is given over to the base uses of Dr. Addison for his roads and houses, for at any rate the airship station could be put into operation next year, whereas Dr. Addison's schemes are unlikely to have any visible effect for at least half a century to come.—G. D.

THE RANKEN DART.

The Royal Commission on Awards to Inventors, under the Chairmanship of Mr. Justice Sargant, on Monday, November 29th, considered the claims made by Wing Commander F. Ranken, O.B.E., in respect to his invention of the Ranken dart, the Baby incendiary bomb, the special operations pistol and the relay tube.

For the claimant it was stated that the Ranken dart, invented when Commander Ranken was a Naval officer on board one of H.M. ships, had been used by the Admiralty, and had brought down one Zeppelin, and that the Baby bomb had been dropped in Germany to the number of 85,000 in six weeks, and had produced many fires. The relay tube had been of great use, and the special operations pistol was designed to facilitate an attack on Zeebrugge.

For the Air Ministry, Mr. Trevor Watson contended that the dart was not of proved utility, and that the relay tube and the pistol were designed as part of Commander Ranken's duty. The incendiary bomb was an important invention, and the difficulty was to settle to what extent it was designed as part of Commander Ranken's duty.

The decision of the Commission will be promulgated in due course.

AN OXFORD R.A.F. REUNION.

A Royal Air Force reunion dinner for members of the University was held at the Clarendon Hotel on Saturday, Nov. 20th, and much credit is due to the Hon. Secretary, Capt. E. C. Haden Tebb and all concerned in the organisation of an entirely successful evening. Major H. R. Raikes, A.F.C., was in the Chair, and Air Marshal Sir Hugh Trenchard, Bart., K.C.B., D.S.O., Chief of Air Staff, was senior guest of the evening. Other well-known figures in the aviation world who were present included Brigadier-General H. B. Hartley, C.B.E., M.C., Lieut.-Colonel W. O. Raikes (on behalf of Major-General Sir Frederick Sykes, who was unavoidably prevented from attending at the last moment), Group-Capt. Blandy, D.S.O., Controller of Communications, Wing-Commander W. D. Beatty, of the Civil Air Staff, Professor Townsend and others.

Despite the counter-attractions of several college functions, the dinner was excellently attended, and Sir Hugh Trenchard received a most enthusiastic welcome. In replying to the toast of the "Royal Air Force," he outlined several new proposals with which he has been recently connected, and announced the sanction of a scheme whereby a number of commissions in the R.A.F. will be available for members of the universities when they have taken their B.A. degree. The usual other toasts were drunk, and Sir Hugh Trenchard proposed "Oxford University" on behalf of the guests, expressing also a desire to revisit us next year on a similar occasion.

One cannot do less than endorse this opinion and hope that there will be a similar occasion or occasions at which we may welcome him again.

A POLICE HUMORIST.

The following statement appeared in the *Times* on Nov. 25th :—

> "The first recorded instance of police court summonses being served in mid-air occurred over Stafford yesterday in the course of an aeroplane flight. Two summonses had been issued against Captain Jones in connection with the dropping of a wreath during the unveiling of a cenotaph at Hanley on Armistice Day. Inspector Adlem went with the summonses to the local aerodrome, from which Captain Jones has been making flights, and ascended with him and his mechanic in the aeroplane. During the flight Inspector Adlem served the summonses on Captain Jones, who afterwards "looped the loop."

To people with an odd sense of humour there may be something of amusement in the methods adopted by Inspector Adlem in the serving of summonses issued by those to whom he owes obedience. In truth such actions serve only to bring the law into contempt. If Captain Jones is charged with a breach of the law the notice of proceedings should be served on him without any action implying that the offence was purely nominal, even though the policeman might in his own opinion think that to be the case. Should the new method become habitual we shall have many other even less stupid policemen thus tacitly expressing their opinions as to the soundness of the Law's actions before each case goes for trial.

NAVAL AND MILITARY AERONAUTICS.

AIR FORCE.

The Inter-Allied Commission.

Air-Commodore E. A. Masterman, C.M.G., C.B.E., A.F.C., R.A.F., President of the Inter-Allied Aeronautical Commission, notified the German Government on Nov. 16th that at the Ambassadors' Conference it was decided to consider the Spa Protocol of July 12th as annulled and the Bologne decision of July 27th as being still in force.

This decision prohibits the manufacture and importation of aircraft material until three months have elapsed after the terms of Article 202 of the Treaty of Versailles have been fulfilled.

Indian Help for the R.A.F. Memorial Fund.

The Secretary of the Royal Air Force Memorial Fund reports that by the last Indian mail a draft for £55 has been received as a contribution to the Fund. This sum is the result of an effort made by His Honour the Lieut.-Governor of the Punjab, the subscriptions ranging from 100 rupees down to 15 rupees. It is particularly pleasing to note that the subscriptions are from distinguished residents of the Punjab, including not a few natives of India who hold Government positions.

The Secretary has also received an announcement that His Highness the Maharajah of Dohlpur is remitting a draft for 300 rupees (roughly, £30).

These are only part of the subscriptions which are being received from the Indian Empire, and they are due to the appeal addressed to the Viceroy, issued in May last, by the Right Hon. Lord Hugh Cecil, the Chairman of the R.A.F. Memorial Fund.

41 Squadron's Dinner.

The annual reunion dinner for officers of No. 41 Squadron will be held at Oddenino's on Saturday, Jan. 1st, 1921. For particulars please apply to Flight Lt. K. C. Leask, Hillingdon House, Uxbridge.

A History of 24 Squadron.

Major V. A. H. Robeson, joint compiler of the "History of 24 Squadron" with Captain A. E. Illingworth, is also numbered among the large band of collaborators who taught one to fly. In reviewing this book, therefore, one finds the longed-for opportunity of the "hun" to get his own back on his instructor, on the principle of the music-hall song now in vogue, "I've got my captain working for me now."

But first of all one must congratulate Major Robeson on the choice of his fellow-conspirator. When one thinks what the history might have been like if someone such as "Wilfred-Adjutant" had been invoked, one shudders. Captain Illingworth has practically confined himself to quoting diaries of officers in the squadron, combat reports and extracts from R.F.C. "Comic Cuts."

One realises only too well what a difficult task the compiling of such a history would be, and it is only natural therefore that there are a certain number of errors in the general layout. One draws attention to these, not in a spirit of carping criticism, but on the principle that if mistakes are made (and everyone makes them), the only way to help the mistake-maker is to point out these.

The first page of text in the book is devoted to the "Principal Battle Honours" of No. 24 Squadron. The correct title would have been "Principal battles in which No. 24 Squadron participated," or words to that effect. A "Battle Honour" is an honour granted by H.M. the King by gazette. Up to the present no battle honours have been gazetted to any unit of the Royal Air Force.

Secondly, Major Robeson addresses his preface from the Royal Air Force Club. This, one believes, is contrary to the rules of the club. Furthermore, he dates his letter, 1st July, 1920, and gives the address of the club as 128, Piccadilly. One would have loved to have seen Major Robeson writing his preface on that date from that address, probably sitting on a tin can, with an inverted soap-box as a table, with bricks and cement falling on all sides, and the raucous cries of the British builder as he laid his daily brick, bringing an atmosphere of charm and repose to this idyllic scene.

Thirdly, one would like to have seen the omission of a "chronological inquisitor." This would have been an excellent feature in a squadron "Souvenir Book' on the principle of that excellent little brochure, entitled "Cinquante Quatre," produced by 54 Squadron. But here is an historical work that will be read by future generations in the Royal Air Force and in 24 Squadron in particular. To them it will be meaningless, and to some it will merely be vulgar. A work of this kind should not and cannot be kept for private circulation only.

There is a foreword by the Chief of the Air Staff, and then what seems after reading his efforts an almost unnecessary apologium by Captain Illingworth. The first chapter deals with the increase of the R.F.C. and other general matters, and then comes that dealing with the formation of the squadron at Hounslow. One remembers well how at that time the members of the R.F.C. were much exercised in their minds as to the production of a fast scout which could fire straight ahead. One recollects how on a certain day in July, 1915, Captain Geoffrey de Havilland appeared at Farnborough on a tiny little pusher scout, and put it through its acceptance tests with what was an amazing performance for those times. This was what was then called the "de Hav. scout," and later classified as the D.H.2, the first and most famous mount of 24 Squadron.

Major Hawker, who commanded the squadron from its formation to the day of his death, was one of the best-known characters in the early R.F.C. An amusing story is told of him which illustrates the change of times between then and now. On one of his first flights to France on a B.E.2c, while flying across the Channel, he got bored and thought his observer needed stirring. So he looped the loop, a remarkable feat at that time. His observer was furious at being treated thus and reported Lieut. (as he then was) Hawker, who was severely censured for dangerous flying.

Major Hawker's influence on the moral of 24 Squadron is well described. Everyone will remember the tales that were current of the appalling habits of the "de Hav. scout." How brave and wonderful it seemed for a whole squadron of scouts to exist, and "de Hav. scouts" at that. By the way, these machines were rumoured to be fitted with 120 h.p. Beardmore engines before their arrival. Excitement was quite intense when looking in Wing Orders to see if any of these machines had arrived.

One also remembers how a team of one's own unit went to play football against 24 Squadron shortly after their arrival in France. How they brought back tales of these "de Hav. scouts" spinning and crashing. Little was known about a spin at that time. The history relates how two pilots were killed through cylinders blowing off and severing tail-booms. But "such incidents in a squadron less keen than No. 24 might have gone far to undermine the moral of the pilots and dispirit the mechanics. With Hawker's squadron they had precisely the opposite effect."

The full story of Major Hawker's death, one of the greatest blows the R.F.C. suffered, is told at length, together with an excellent character sketch of the man.

That terrible winter of 1916-17 is fully described, and some excellent glimpses into mess life at that time are given, which conjure up such memories.

The troubles and disappointments of the squadron are set forth in detail. One is told here for the first time that the D.H.5 was a failure.

Those who knew him will appreciate the references to Lieut.-Colonel F. V. Holt, who at that time commanded the XXII Wing.

The immediate resurrection of success on the advent of the S.E.5a is interesting, as also is the fact that the machine was more popular when fitted with 180 h.p. Wolseley "Viper" than the 200 h.p. French Hispano-Suiza.

Extracts from Major Robeson's diary give the best account yet that one has seen of the part played by the R.F.C. in the great retreat. A significant sentence is as follows:—"All R.F.C. officers will realise how much General Trenchard's visit at this time did to buck us all up."

In the account of the death of Rittmeister Baron Manfred von Richthofen, Captain F. E. Brown is given as the pilot who shot down the "Red Air Fighter." The period during which the new Fokker appeared and tried vainly to re-establish the ascendency in the air for the German Forces is faithfully dealt with and the immense amount of work that fell on the shoulders of each individual pilot is reminiscent of McCudden's account of the early days of the fighting.

How strange and unreal the end of the war seemed to a fighting unit may be seen from the following extract from Major Robeson's diary: "Nov. 11th.—We went up to the aerodrome only to discover that the bottom has fallen out of the war. After 11 a.m. we are not to shoot at a Hun under penalty of court-martial. It takes a bit of realising."

Then follow copies of congratulatory messages from the various commanders of the higher units and some squadron group photographs of various dates. After that is the "Chronological Inquisitor," to which reference has already been made, and then the Roll of Honour, list of orders and decorations, list of combats, low-flying work, bombing, squadron movements, etc., and the whole is brought to a conclusion with a nominal roll of all ranks, followed by present addresses.

The work is illustrated by pictures by Captain R. H. M. S. Saundby, M.C., who for some time served with 24 Squadron. The pictures are those that have appeared in "Flying Colours." Captain Saundby's impressions of the D.H.2 are so exactly the impression one *did* get of this machine on the line. When tearing along at a rate of knots in a cumbrous F.E.2b, one was always seeing a D.H.2 either diving or climbing in a vertical position, or standing on a wing-tip in the air, and that is the very impression that the artist has conveyed.

Altogether a most valuable book, and one of the few which one has seen for which posterity will be grateful. It may be had for 16s. from THE AEROPLANE Publishing Dept., 61, Carey Street, W.C.2.—G.D.

THE THAMES AS AN AERODROME.

It is believed by many that London's Real Aerodrome is the River Thames, and not one or other of sundry large fields from 6 to 10 miles outside London.

"Why drive miles through heavy traffic when London's Aerodrome is by nature more central than any of London's railway termini?" That is the question asked by some of the most enlightened people concerned with aviation.

"Because the traffic on the River Thames is too thick, and the river is too narrow to make it a safe place for the alighting or departure of seaplanes." That is the reply of the people who do not know what has already been done.

BUT IS IT?

For the last two years of the war almost all Fairey Seaplanes delivered to the Royal Naval Air Service and the Royal Air Force were sent by road from the firm's works at Hayes, Middlesex, to the nearest point on the Thames at Isleworth, where the river is quite narrow, and were flown off the river, down which they flew, right through London, to the air stations on the Coast.

Not one of those machines ever had an accident, nor did any of them damage any of the ordinary river traffic. That was the first regular use of the River Thames as an aerodrome. And it was used under the most difficult conditions.

AFTER THE ARMISTICE.

When hostilities ceased and all businesses began to boom, an enterprising newspaper desired quicker deliveries to readers at the holiday resorts in the Isle of Thanet during the Summer of 1919 than could be given by rail or road.

Consequently a Fairey Seaplane was engaged to carry copies of that paper daily to Margate. And the service was maintained very satisfactorily so long as the newspaper required it. And this time the machine started from Blackfriars Bridge, in the middle of London.

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Once more, as may be seen, the Fairey Company has done pioneer work, which has shown what can be done with a seaplane, when that seaplane is of the highest class, and is properly handled by a competent pilot and competent engineers.

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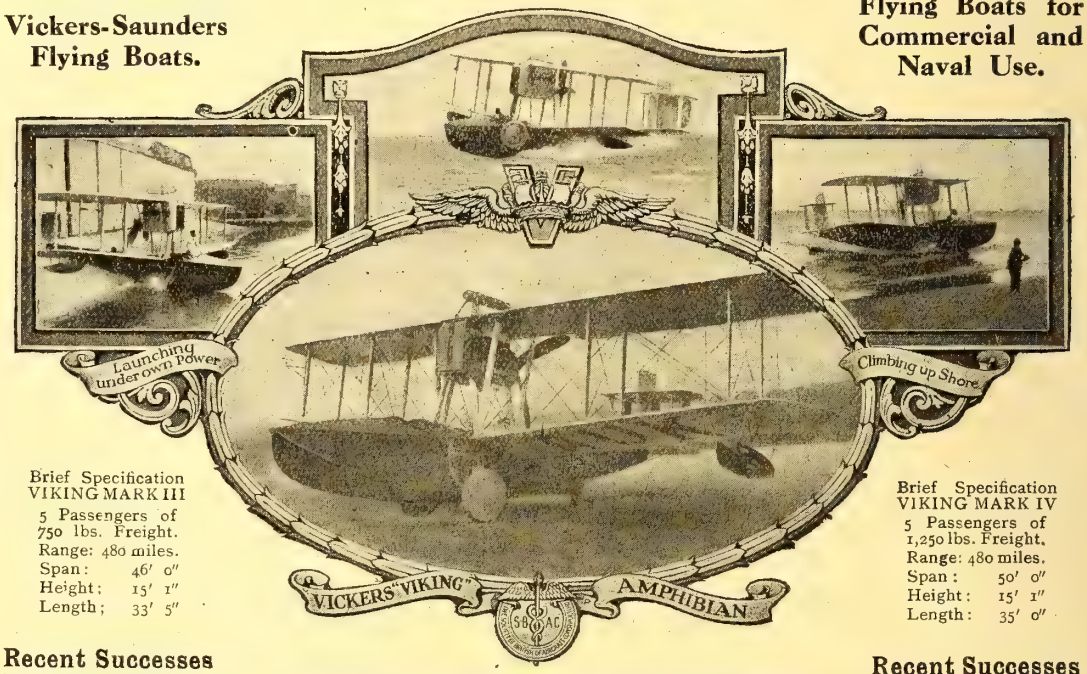

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The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

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2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
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THE WEEKLY COMMENTARY.

In the article below Capt. Sayers discusses the reasons why the R.A.F. needs a Technical Staff, the qualities which are required of the officers of such a Staff, and some of the facilities which the R.A.F. possesses, or has possessed, for building up that which is undoubtedly required.

Finally, he inquires as to what steps the R.A.F. has taken to provide itself with men possessing the required qualities. The answer appears to be "Nothing."

The "V.C.P." racing machine, which was entered by the American Army authorities for the last Gordon Bennett Race, and which has just won the race for the Pulitzer Trophy in America—at a speed reported in the Daily Press as somewhere between 190 and 215 m.p.h.—is described on page 848.

The Leitner-Watts metal airscrews with separate adjustable steel blades are described in this issue. This type of airscrew is an excellent example of how intelligent design may enable one to provide appliances to meet widely differing conditions by the use of a relatively small number of standardised component parts.

ON THE FUTURE TECHNICAL STAFF OF THE R.A.F.

In the discussion on Air Marshal Sir H. M. Trenchard's paper on "Aspects of Service Aviation," which was read before the Air Conference on Oct. 14th, Lieut.-Colonel the Master of Sempill raised the very important question of the status of the Technical Officers of the R.A.F.

This subject has been alluded to in this journal on several occasions, and in particular the vital importance to the Air Force in the present stage of the development of aircraft of a sound Technical organisation, staffed and manned by really competent officers and men has been emphasised.

It was pointed out by one "Strasbourg" that war experience had proved that competent pilots could be manufactured at a rapid rate if the necessity arose, and that the production of aircraft in quantity for these pilots to fly was within the capacity of the British Engineering Industry, but that it was essential in order to use the nation's capacity for producing both flying personnel and flying matériel that the Air Force should possess a really first-class Technical Staff, acquainted not merely with the technique of applied aerodynamics, but also with the technique of aerial warfare.

That same writer has also pointed out certain of the difficulties to be overcome in any attempt to improvise at short notice a competent Technical Staff.

Briefly, these difficulties are due to the very nature of the qualities which are necessary to the making of a really useful Technical Officer.

The Functions of a Technical Staff.

Consider the position which will face the Air Ministry in the event of an outbreak of war on a large scale.

The permanent squadrons, reinforced by officers and men from the Reserve will at once be used as a striking force. Probably they will be depleted of a certain number of permanent officers and men who will go to strengthen training establishments at home. All existing training establishments will be hard at work training new pilots and mechanics—including demobilised R.A.F. officers and men, who have lost touch with their old force—for the necessary expansion of the personnel of the Service.

This expanded personnel must be provided with equipment, and for their equipment they must depend on the work of the Technical Staff.

If that Technical Staff is a competent one; if it is acquainted thoroughly with the latest developments of aeronautical technology, with the art of aircraft manufacture, with the strategy and tactics of war in the air, with the general conditions of the British Engineering Industry, with the organisation of the Air Force itself, and if it possesses practice in the art of handling men, it will be capable of dealing with the situation.

It will possess all the knowledge necessary to decide what types of machine are called for by the particular demands of the actual leaders in the field, and it will be able to distribute the orders for such machines in accord with the manufacturing facilities existing. It will be able to instruct aircraft designers intelligently as to new types of machine which may be required with a proper appreciation of the sacrifices which may be expected in general all round performance by the exaggeration of some specific characteristic, and with a knowledge of the extent to which such a sacrifice in one direction will detract from the fighting value of the resulting machine.

And, further, it will be a staff capable of absorbing from the technical professions specialists in any of the branches of science which affect the general problem, and of co-ordinating the work of those specialists to the complex needs of the situation.

The Difference Between Technical Staff and Engineer Officers.

It will be seen that the qualifications called for in the efficient discharge of the duties of a Technical Staff are very wide. They are qualifications quite different from those needed to make a capable aircraft designer, repair shop engineer, or squadron engineer officer. They embrace a sound understanding of the work of all these and of many other arts and crafts in addition.

It is scarcely possible to produce what has here been defined as a capable Technical Staff officer except from men possessing initially certain not particularly common mental qualifications.

The Personal Qualities Needed.

They must be men of a high order of intelligence, capable of enthusiasm, but free from prejudice, and possessed of habits of both mental and physical industry. They must in addition be men proved in the school of hard practical work.

It is always rash to lay down hard and fast rules for the treatment of men who are expected to possess rare and unusual qualities, and it is just this fact which makes the provision of an adequate Technical Staff for such a force as the R.A.F. one of extreme difficulty.

But it does seem fairly obvious that if there is one rule which could safely be applied to such Technical Staff officers it would seem to be "When you have found a good one, keep him!"

A Lost Opportunity.

At the end of the late war the Air Ministry had an opportunity, which will never recur in times of peace, of laying the foundations of a really able Technical Staff. There were then in the ranks of the Royal Air Force large numbers of young men, possessed of engineering or allied technical training, who had served in that force for periods of from 4½ years downward. Some of them were mere specialists, unconcerned with any aspect of Aviation outside their own department.

Quite a number of them were enthusiastically interested in the development of aviation as a whole, and in the technical problems presented by the Air Force as an organisation.

Among these latter doubtless numbers were lacking in one or more of the essential qualities which were above laid down

as those of a good Technical Staff officer. Many certainly possessed little organising ability. Some were bad officers, in that they lacked, occasionally a capacity to control their juniors, more frequently the ability to treat with proper respect men who were both in fact and in rank their superiors, but who lacked in some respect their own detailed knowledge of technical work.

How a Technical Staff Might have been Evolved.

But it is certain that a careful selection from among these officers would have produced a very fine nucleus for the Technical Staff of the Air Force of five years hence. These officers would have been mostly of relatively junior rank, and of no great age. They should have been granted permanent commissions and, where necessary, given opportunities for training in administrative duties in the specialised sense which that word has acquired in H.M. Services.

And forming, as they would have formed were they intelligently selected, the pick of the younger generation of the British professional classes, they should have been offered their permanent commissions with the guarantee of a reasonably well-paid life career, if at the end of, say, three years of probationary service they were accepted definitely for specialised training as Technical Staff officers.

Actually what has happened has been that very few indeed of these technically trained young men have received permanent commissions. In one very important establishment, which is entirely devoted to practical research in the use of aircraft for service purposes, of a total strength in officers of approximately twenty, there are but three officers holding permanent commissions.

The Staff of an Experimental Station.

Of these one is the commanding officer—a pilot of extraordinary ability, with a general knowledge of engineering and a large experience of the control of experimental establishments.

A second, of fairly senior rank, is an engineer of distinctly smaller general experience than his C.O., but probably possessed of a higher order of scientific knowledge than is that officer; and the third, as far as it can be discovered, is the Medical Officer.

Among the remaining technical officers of this establishment, not one with a permanent commission, there is to be found at least one each with the following qualifications :—

A sound knowledge of the theory and application of aerodynamics.

A wide experience in the structural design of aeroplanes.

A long experience and a very high reputation as a test pilot.

An extremely capable and efficient repair shop manager.

There are, in addition, engine officers and technical stores officers of a very high grade and of long experience.

At this one establishment there is ample employment for all these diverse capacities, and that employment is of a type fundamentally different from that which is involved in the running of a normal squadron or establishment.

An Ideal Technical Staff Training Centre.

The whole station is—in theory, at least—devoted to the technical development of aircraft for the special needs of the Service. The work of that station affords to those employed thereon absolutely unique opportunities for gaining exactly that type of technical experience which is needed by the Technical Staff of the Air Force of the future.

Officers employed thereat are in constant contact with the representatives of the few remaining aircraft designing firms, and have unique opportunities of realising the difficulties which beset the path of the constructor.

They are continually in contact with the most advanced designs of aircraft and they have the opportunity of discovering what is and is not possible in the way of designing to meet special Service needs.

They are concerned with the handling, maintenance and overhaul of machines, engines and armament of the most varied type, and they are in the Service and are naturally in a position to know the general lines whereon that Service is organised.

It is fairly obvious that this particular station affords almost unrivalled opportunities for the advanced technical training of the Technical Staff officers which the Air Force will need in the future. And yet that station is, with the exception of the three examples already cited, entirely officered by men whose commissions will terminate in three or four years.

All these officers are relatively young, all of them have already a number of years of satisfactory service in the Air Force, and there is not one of them to whom the Air Force can confidently look for Technical guidance in the future.

Where are the Technical Officers of the future to come from? As far as can be gathered, from the R.A.F. Cadet College.

And from whom are they to receive the technical instruction to fit them for their work?

One Form of Technical Training.

There is a story current in the establishment above referred to which alleges that a certain gentleman of schoolmasterish aspect, with no knowledge of engineering and only an elementary acquaintance with academic mathematics, was sent down to receive instruction as to the methods adopted in working out the stresses in the structure of an aeroplane.

This gentleman, it appears, had been appointed as one of the instructors at the R.A.F. Cadet School, and was charged with instructing future officers of that Service in the mechanical aspect of the theory of aeroplane design.

His stay was limited to four days, at the end of which he departed—presumably with as much information as he was capable of absorbing upon this not unimportant subject.

Is the future Air Force to receive its technical instruction from teachers of this type?

The Type of Knowledge Needed.

It is very generally believed that it is not really necessary that an officer in such a service as the Air Force should possess any very deep technical knowledge of the arms wherewith he is to fight, and that a smattering, conveyed to him by persons of very limited knowledge is all that is required.

This is in general partly true—in so far as it relates to the flying officer pure and simple. He does not need any very recondite knowledge of aerodynamics. But it is important not only in this case but in all cases, that such knowledge as he has, however elementary, should be strictly accurate within its own limits. It is further important that that knowledge should be in the form of an intelligent appreciation of principles, and not in the form of a collection of memorised data.

In the case of officers destined for a position on the Technical Staff—that is to say, for that portion of the organisation of the Air Force whose functions are at present discharged by the Directorate of Supply and Research—it is absolutely essential that the standard of general technical knowledge should be on a very high plane.

The Want of a Common Tongue.

Half of the mess and confusion which characterised the Technical Department, Air Ministry, during the war was due to the fact that it was a mixed assembly of officers possessed of war experience of one kind or another, and technical specialists co-opted from civilian life, interspersed with intellectual nonentities possessed of material influence.

Very largely these various components did not use the same language, did not think in the same terms, and were entirely without capable interpreters.

The Technical Staff of the Air Force must, in the present state of affairs, be a nucleus organisation. If that nucleus is to be capable of orderly and effective expansion in time of war it must be composed entirely of men possessed of an ability to use and co-ordinate the work of experts and others from without the Service.

They must be able to confer with scientists in their own language, and they must be able to interpret the results of that conference into terms understandable by practical constructional engineers, by officers of the military branch of the Air Force, and even, in emergencies, by the politician.

They must be able to take the report of the narrow-visioned specialist and sift out therefrom the essential conclusions in the light of their own broad knowledge of the whole subject.

They must be able, if they are to be of real value, themselves to determine the extent to which a compromise should be effected between such conflicting demands as those of design for a specific high performance and design for ease and simplicity of manufacture.

The present Air Force possesses no such Technical Staff. It shows no sign of having realised the necessity for one.

The staff of the present Technical Departments have been chosen from among the war-time officers mainly on account of their knowledge of the administration of technical affairs, and they have on the whole been extraordinarily well chosen. But they are not an ideal technical staff, and there is no sign of there being any existing source of supply for their successors.

Of those holding permanent commissions the great majority are skilled flying officers with a smattering of engineering knowledge.

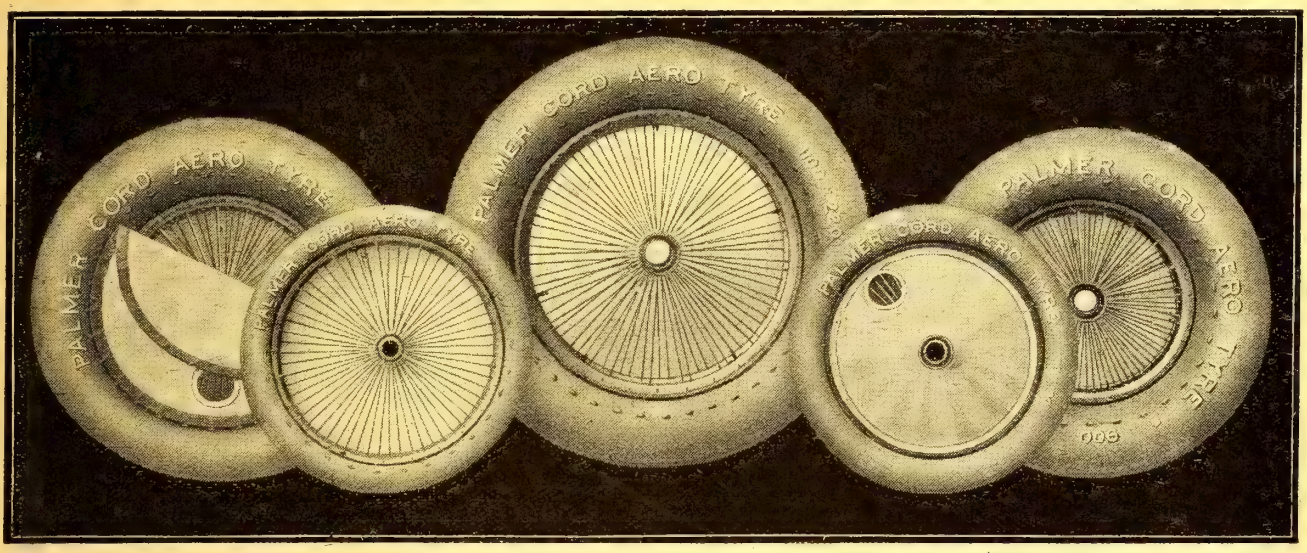
Those holding temporary commissions are fairly evenly divided between experienced pilots with some technical knowledge and men with highly developed specialised technical knowledge and a smattering of flying experience.

The number of those who combine a wide and clear knowledge of the technique of aeronautical engineering, with any large practical experience of the use of aircraft is minute.

And among the demobilised officers of the R.A.F. who have to all intents and purposes abandoned all hopes of maintaining their professional connection with aviation, there are ten such men to every one now in the Royal Air Force.—W. H. S.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
300×60	16	111.12	25.4	Central
,,	17	72.39	12.7	Central
450×60	30	89.	31.75	Central
,,	138	130.	38.09	Central
575×60	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	34	150.	31.75	104/46
,,	111	150.	38.09	104/46
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
650×125	119	178.	55.	132/46
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	96	178.	55.	132/46
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
800×150	82	185.	55.	135/50
,,	85	185.	55.	Central
,,	*36	185.	55.	135/50
,,	*40	185.	60.32	135/50
1000×150	131	220.	66.67	Central
,,	102	185.	55.	125/60

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	141	250.	80.	Central
,,	201	185.	60.32	125/60
,,	209	185.	55.	Central
,,	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
1250×250	133	250.	80.	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central

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L/D/NE.

THE LEITNER-WATTS METAL AIRSCREW.

In a short note last week the fact that a Leitner-Watts metal airscrew had been successfully used on tests of a Bristol Tourer seaplane was briefly recorded. The history of the Leitner steel construction of airscrews extends to a much earlier date—it was, one believes, not later than 1916, that Mr. Leitner built a steel airscrew for a 110 h.p. Le Rhône engine, which, after many delays, was tested and gave entire satisfaction to the Technical Authorities, and at the end of the war such airscrews were on order in considerable numbers. These, however, were fixed screws designed for specific performances.

The type now in question, which is due to the collaboration of Mr. Watts as airscrew designer with Mr. Leitner, is the new adjustable type designed for commercial purposes, which is built with detachable blades.

The result of this construction is that using quite a small number of standardised blade forms, in conjunction with bosses which will mount either two, three, or four blades, and finally by adjusting the angle of the blades in the boss, an enormous variety of different types of aeroplane can be fitted with suitable airscrews, all of them assembled from a relatively small number of different components

The illustrations here reproduced show the methods employed. Fig. 1 shows the construction of one of the standard blades. The blade is formed of two mild steel pressings, edge welded together, reinforced by a number—in this case two—of internal liners. These are shown by the dotted lines in the plan view of the blade, which show that the total thickness of metal is gradually reduced from boss to tip in accord with the stresses set up in the blade by rotation. These reinforcing liners are edge welded, and they are also either riveted or spot welded to the outer sheath along their edges only, and thus, although they are in contact with the outer plating, they are not rigidly attached to it except at the edges of the liners.

The boss end of each blade is formed of circular section, and is reinforced within and without by further liners, which are machined from forgings.

These liners lock between them the turned-over edges of the actual blade sheets, and are clamped together by a screwed-in plug in the end of the blade.

The actual form of this blade end is clearly shown in both Fig. 1 and Fig. 2.

The bosses, two, three and four blade, types whereof are shown in Fig. 2, are machined from steel forgings, split on the plane of rotation of the airscrew, and clamp the blades in position, when they are held positively by the shoulder on the end of the blade itself.

To the circular root of each blade there is attached a lug—shown in the section AA, Fig. 1, and on each socket of the boss there is a corresponding lug, clearly shown in Fig. 2.

A forked eye-bolt, engaged with the lug on the blade, passing through the lug on the boss, provides a simple and delicate method of adjusting the blade angle to suit the particular conditions of use.

Vernier scales are fitted to blade and boss, and adjustment of the blade angle can be made in this manner to 1/10 deg.

Extreme care has been taken in the design of these airscrews to secure ample strength; practical test has shown them to be reliable and very free from vibration of any kind. They will not warp, lose pitch or performance, a damaged blade can be replaced from stock instead of calling for a complete new airscrew, and each airscrew can be adjusted to give the best results on the particular machine to which it is fitted.

Owing to the standardisation of parts, the number of dies and jigs required to manufacture airscrews for a very wide range of power and speed is quite small, and the cost of manufacture is greatly reduced, as airscrews for special conditions can be fabricated from these standard parts. The screws themselves are proof against the effects of rain or spray, and should have an indefinitely long life. The commercial advantages of the steel over the normal wooden airscrew are obvious.

It is understood that the Air Ministry and practically all the known aircraft and air transport firms have placed trial orders for airscrews of this type.

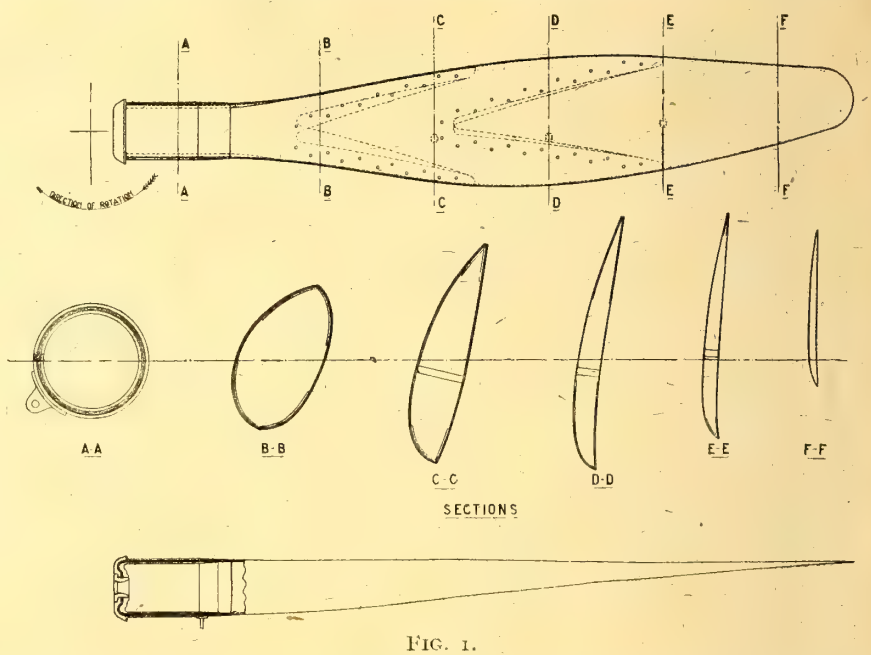


Fig. 1.

NOTICE TO GROUND ENGINEERS, No. 14, 1920.

Beardmore Engines, 120 h.p. and 160 h.p.—Water-pipe, Part No. 11358/12.B., connecting the top water rail with the carburettor jacket.

It is hereby notified:—1. Certain engines of Beardmore 120 h.p. and 160 h.p. types were supplied with the water pipe made of copper tubing, but owing to cases of failure it became necessary to introduce a modification and the material was changed to steel to Air Board Specification S.26, the lower end of the pipe being connected by a short length of flexible P.R. tubing.

2. It is therefore recommended:—

(i) That any engines which have not already been modified should be converted as above before installation in civil aircraft.

(ii) That in cases of failure of this pipe in any engine not so converted and already installed, this modification be introduced forthwith.

Air Ministry, Nov. 23rd, 1920.

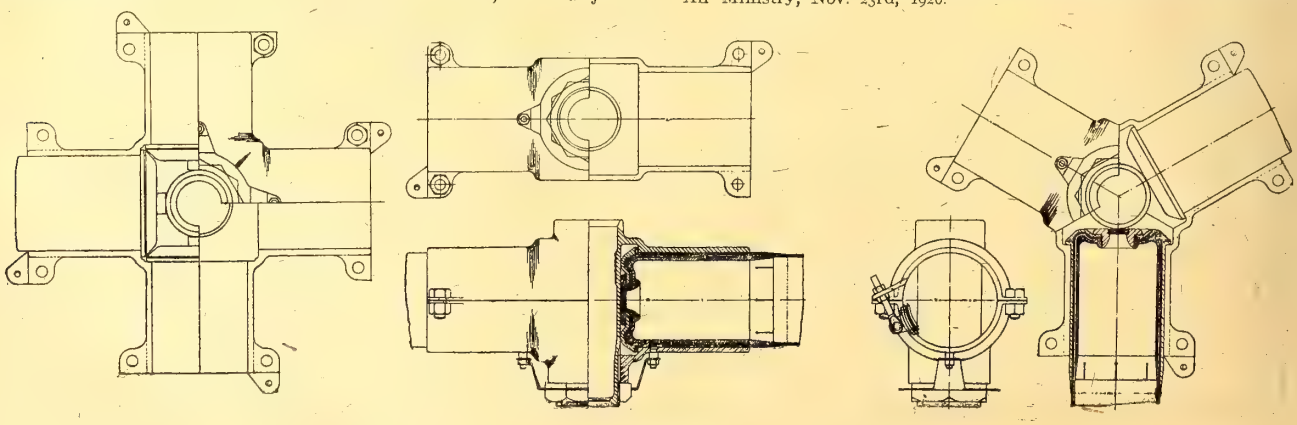
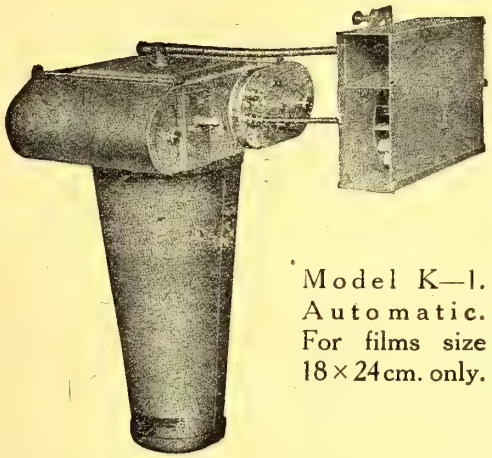


Fig. 2.

Aerial Photography



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COMMERCIAL AIRSHIPS.

Commercial Airships. By H. B. Pratt, M.I.N.A. 235 + XIII pp. (Thomas Nelson and Sons, Ltd. 15s. net.)

In view of the fact that it is the intention of the Air Ministry, by way of the Department of Civil Aviation, to run airship lines from London to the near Middle East next year, it is eminently desirable that those who believe in the ultimate success of Air Transport should be well informed on the subject.

It will be remembered that efforts have been made during the past twelve months to form a syndicate of engineering and shipping firms to co-operate with the Air Ministry in running such airship lines. The formation of this syndicate fell through because the commercial interests concerned recognised that existing airships are not a commercial proposition, having been built purely for war purposes. Also the said commercial interests either had not the money or had not the faith to build genuine commercial airships out of the knowledge gained from the war airships. Hence the Air Ministry's proposal to use the existing war airships on experimental air lines in the hopes that the necessarily limited success to be achieved will encourage the financial interests to build and operate commercial airships in the future.

All those interested in the problems thus raised will find a mine of information in "Commercial Airships." The author, Mr. H. B. Pratt, Member of the Institute of Naval Architects, is chief engineer of the Airship Department of Vickers Ltd. at Barrow-in-Furness. Though in fact the airships which have made the most sensational voyages, such as crossing the Atlantic and making long voyages over Europe, have not been Vickers' products, the fact remains that the Airship Department of Vickers Ltd. has probably acquired even more knowledge of airship construction than any other one firm. One makes this statement because the first rigid airship ever built in England was constructed at Barrow under Naval supervision, and the last successful rigid airship built in this country, the R.80, is also a Vickers' product.

The pith of all this knowledge is embodied in Mr. Pratt's book, and in it he shows that not only is he an engineer of ability, but a remarkably trustworthy historian. Such minor errors as one can discover in his history are either typographical, or omissions possibly necessitated by the need for compression.

It is of considerable interest to note his definite statement that "the first successful airship in England was a small non-rigid of 12,500 cu. ft., built by Willows at Cardiff in 1905. It made several successful flights and was the first ship to be fitted with swivelling propellers." Mr. Pratt is one of the few historians to do justice to Mr. E. T. Willows, the real pioneer of airships in this country, and now engaged in the operation of coastal shipping.

Perhaps the only serious omission is where, in recording the Admiralty's purchase of an Astra-Torres airship in 1913, he does not mention that the ship was bought through Mr. Holt Thomas, who afterwards founded Airships Ltd., which firm built or superintended the building of a large number of non-rigid airships subsequently. The part played by Airships Ltd. in relation to the Astra-Torres type was, in fact, the same as that played by Vickers Ltd. in relation to the Parsevals, only more so.

He might also have mentioned that the S.S. type airships, commonly known as "Blimps," were the combined idea of the late Commander Usborne, Mr. E. T. Willows, and the late Lord Fisher, and that the onomatopœc name was coined by that prince of humorists, the late Horace Short, of seaplane fame.

The book is excellently arranged, for, following on the purely historical portion, Mr. Pratt proceeds to discuss the commercial possibilities of airships as illustrated by past performances, the said performances being chiefly those of war type Zeppelins and the post-bellum Zeppelin ship "Bodensee." Thereafter he argues the case for the airship as a means of transport, and does so most convincingly. He then leads the reader on to possible transport routes and proposed types of airships so that the interest and education of the reader grow concurrently.

Thereafter he deals with airship stations, present and future. Which being done, he proceeds to the financial end of his subject and lays down figures for costs of maintenance. After which he goes into the more technical sides of his subject, such as meteorology, handling and navigating, structure, power plants, internal arrangements, suggestions for improvements, and so forth, so that by the time anybody of an ordinarily mechanical turn of mind has read the book he or she should have a very comprehensive all round knowledge of the present and future possibilities of airships.

A most interesting appendix to the book is a verbatim copy of the log of R.34, as kept by Brigadier-General E. M. Maitland, C.M.G., D.S.O., on her trans-Atlantic voyage in July, 1919. The illustrations in the book call for very special mention. Whether photographs of antiquated airships or of the latest types, or wash drawings of future machines, or line drawings of general arrangements, or graphs dealing with the operating figures of airships, they are all excellently produced. In fact, nothing so convincing as this book has ever been done on the subject of airships.—C. G. G.

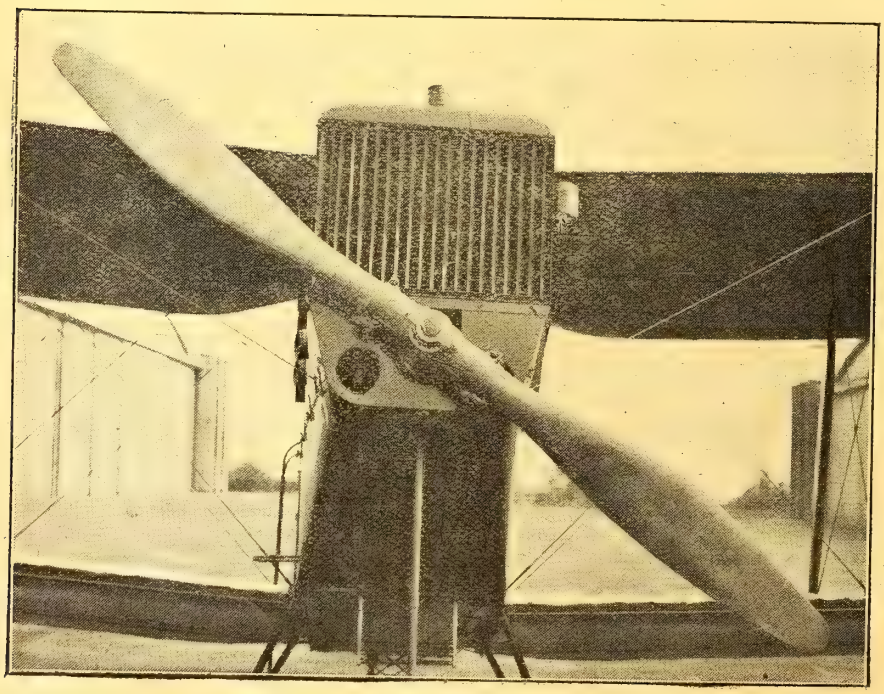
THE CAPRONI GIANT.

A description of Ing. Caproni's long expected 3,200-h.p. triple hydro-triplane has appeared in *La Gazzetta dell'Aviazione* over the signature of Guido Mattioli, a technical writer who has accompanied Maddalena in most of his long cross-Europe seaplane flights.

The boat is built of three-ply, internally strengthened on the lines of the system used for railway carriages, and the three sets of planes are some 40 metres span with elevator ailerons, no other longitudinal control surfaces being employed. The wing section is Caproni normal.

The eight Liberty 400-h.p. motors are mounted in tandem, four on the foremost and four on the rear triplane, in power eggs connected by two dummy fuselages. Control is by wheel with patent ball-bearings throughout, and is expected to relieve the single pilot of undue strain. Electric light signalling for conveying orders to the engineers has been adopted and the machine has been designed to fly on four engines only and to be automatically stable, a slight longitudinal dihedral being a help to this latter end. 98 passengers are to be seated in the hull.

The name of Semprini is given as that of the pilot engaged for the tests, a good man indeed.—T. S. H.



A PRACTICAL COMMERCIAL AIRSCREW.—The photograph here reproduced shows one of the Leitner-Watts separate-blade steel airscrews mounted on a "Puma"-engined Bristol "Tourer." The constructional details of this type of airscrew are dealt with at some length on the preceding page. The particular airscrew here shown is one of the first constructed, and was made before the dies for pressing blades were complete, the shaping being done by hand. In spite of this handicap the screw has given very satisfactory test results under all sorts of flying conditions, particularly on a seaplane, in which the spray thrown up by the floats does much damage to ordinary airscrews.

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October, 1920.

All letters on the undermentioned subject should be addressed to THE SECRETARY at the above address and should quote

Air Ministry Refce. 344425/20 (C.G.C.A.) Your Refce.

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A TREATISE ON AIRSCREWS.

The following letter has been received :—

Sir,—Reviewing Mr. Park's book "A Treatise on Airscrews" in this week's issue, your reviewer drew the natural inference from the author's preface, and referred to his many years' experience of successful airscrew computation with Lang Propellers, Ltd..

Will you allow me to point out that as designer to Lang Propeller, Ltd., from August, 1915, to the end of December, 1918, I designed all the firm's airscrews and was responsible for all methods of computation during that period. After resigning in order to take up my present position I was due to leave the firm in September, 1919, but at the request of the manager, Mr. May, I agreed to remain until the end of the year in order to initiate the new man in the methods of the office. If I remember aright, Mr. Park came to the firm in August, 1918, and succeeded me as designer.

Not having yet read "A Treatise on Airscrews," I am unable to subscribe to the author's claim that the methods expounded in his book are those developed by the Lang Propeller Co. In any case, I am writing in self-defence and not as a critic of the work.—(Sgd.) Joseph P. Doyle.

[Reference to the wording of Mr. Park's preface show that the phrase he actually used was that the book "in general follows the methods developed by the firm of Lang Propeller, Ltd., as a result of their experience in the manufacture of propellers for aircraft from 1909." Mr. Park therefore does not explicitly claim to have participated in this lengthy experience himself, but the impression given to me by that statement was that which was expressed in the review in question. —The Reviewer.]

TRADE NOTES.

A Triumph for British Magnetos.

Although the use of foreign magnetos was allowed in the recent Air Ministry Competitions for Aeroplanes and Seaplanes (Amphibious), the whole of the eight prizes awarded were won by machines fitted with British magnetos.

Art.

There are numerous artists who insist on drawing and painting aeroplanes in flight. In the great majority of cases, one wishes they would turn their attention to the motor trade, as it is impossible to do any further harm there. The majority of the said artists who insist on drawing aeroplanes usually succeed in making their machines look as though they have been thrown on the paper and stuck there.

There is one artist, however, who has caught the idea of depicting aeroplanes so that they really appear to be flying. One refers to Mr. Leonard Bridgman, whose sketches and scale drawings are well known to readers of The Aeroplane. He exhibited some water colours of machines on the stand of The Aeroplane at the Aero Show, Olympia, this year. These attracted an enormous amount of attention, and in consequence Mr. Bridgman had his hands full for some time. He is now, however, able to undertake further work, and anyone interested is invited to call at these offices and inspect his work. Aircraft companies, particularly those which operate air lines, also booking agencies, should certainly get into touch with him. His pictures are ideal for adorning waiting-rooms and offices, and enhance the beauty and publicity value of advertisements, of which Mr. Bridgman makes a speciality.

G. D.

Burberry's December Sale.

A good thing cannot happen too soon or too often, and Burberry's action in accelerating their Annual Sale and beginning it on Dec. 1st, instead of in the New Year, will be welcomed by the many people who are anxiously awaiting an opportunity to replenish their wardrobes with every kind of garment at about half the usual prices.

The reason for this change of date is one of annual accounting, which makes it more convenient for the firm as an incorporated company to close its books a month earlier than hitherto.

Large stocks of models have accumulated during the year, and a great many weatherproof topcoats, suits and gowns of superb quality and distinction, specially designed for sport, recreation or business, have been made up from short lengths and surplus materials. In size, character and variety, this sale transcends anything hitherto attempted in the metropolis as a means of ensuring economy and healthful protection to everyone who values choice cloths and practical models obtainable at pre-war prices.

The chance of combining the saving of money with the acquisition of such useful and distinctive articles is one of very rare occurrence, and should be especially appreciated by prudent benefactors who desire to bestow Christmas and New Year gifts, which shall earn for them the full meed of the gratitude they deserve.

An illustrated catalogue of the sale, both for the men's and women's departments, is published, with measure forms and particulars as to conditions and prices, which will be sent post free on application by postcard to Burberrys Ltd., Haymarket, S.W.1.

COMPANY NOTICES.

A Company Meeting.

At the annual meeting of the Birmingham Small Arms Co., which was held on Nov. 5th at the Grand Hotel, Birmingham, Sir Hallewell Rogers, the Chairman, in the course of his address, said :—

"Now, gentlemen, you may think I have painted a very depressing picture, and infer that we look upon the present and the immediate future with a certain amount of dismay, or, at least, of doubt. But this is very far indeed from being the case. In some directions undoubtedly the change in conditions between a year ago and now is an important factor in making one of our investments unremunerative. We decided, for example, in the course of last winter, to acquire the Ordinary shares of the Aircraft Manufacturing Co., Ltd., and Peter Hooker, Ltd., by an exchange of our own Ordinary shares.

"So far as Peter Hooker is concerned, it looks at the present moment as if little, if any, return could be expected from the shares we have bought. The situation which has resulted from these purchases is a complicated one, in which many interests are involved. Proposals have been made to the prior shareholders of the Aircraft Manufacturing Co., and they have these proposals now under consideration. It would, therefore, be premature to discuss them now, but if the scheme which they embody is adopted and carried through successfully, it should result beneficially to all parties. I refer to this to-day only to tell you that the changed conditions to which I have referred have affected this purchase very adversely. But fortunately it is an eventuality we have provided against by the very ample reserves which we have been careful to make, and it will be satisfactory to you to know that, if the final result is bad, the profits will not be affected."

New Company.

Institute of Physics.—(The word "Limited" is omitted from the title by licence of the Board of Trade.) Registered Nov. 1st, as a company limited by guarantee. Objects : to elevate the profession of the physicist, and to advance and diffuse a knowledge of physics, pure and applied. The management is vested in a Board of four persons to be appointed by each of the Faraday and Optical Societies and seven by the Physical Society. Other Societies who may enter into participation during the existence of the first board shall each have the right to nominate an additional member. The first members are :—

Sir Richard T. Glazebrook, K.C.B., F.R.S., 63, Grange Road, Cambridge, Professor of Aviation and Director Aeronautics, Imperial College; C. H. Lees, F.R.S., Greenacres, Tonbridge, Professor of Physics, University of London; Sir R. A. Hadfield, Bart., F.R.S., 22, Carlton House Terrace, S.W., metallurgist; C. C. Paterson, O.B.E., General Electric Co., Ltd., Director of Research Laboratories; J. E. Barnard, National Research Institute, N.W.3, physicist; R. S. Whipple, 15, Creighton Avenue, N.10, manufacturer of scientific instruments; Major E. O. Henrici, R.E., 29, Royal Crescent, W.11; W. R. Cooper, 82, Victoria Street, S.W.1, engineer; E. H. Rayner, 40, Gloucester Road, Teddington, physicist; Major C. E. S. Phillips, O.B.E., 34, Bedford Gardens, W.8, physicist; W. H. Eccles, 2, Ryder Street, S.W.1, physicist; T. Y. Baker, National Physical Laboratories, Teddington Institute, Commander R.N.; A. W. Porter, F.R.S., University College, W.C., Professor Physics, University of London; T. Smith, National Physical Laboratory, Teddington, principal assistant; H. S. Allen, 14, Wilton Road, Edinburgh, Lecturer, University of Edinburgh; R. S. Clay, Northern Polytechnic Institute, Holloway, Principal; F. J. Cheshire, Imperial College, South Kensington, S.W.7, Director and Professor Optical Engineering Department of Imperial College; R. Knox, 38, Harley Street, W., radio therapeutist.

Mortgages, Charges and Satisfactions.

Cadogan Carriage Co., Ltd. (formerly R. G. Toms Aviation and Motor Co., Ltd.)—Particulars of £3,500 debentures authorised Oct. 14th, 1920, present issue £1,000 charged on company's undertaking and property, including uncalled capital.

Lang Propeller, Ltd.—Issue on Nov. 3rd, 1920, of £1,000 debentures, part of a series already registered.

Receivership (Appointment).

Martinsyde, Ltd.—D. S. Fripp, of 90, Cannon Street, E.C., as receiver and manager by Order of Court dated Nov. 2nd, 1920.

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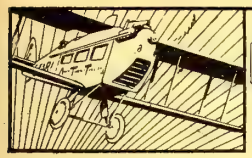
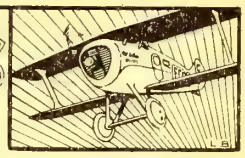


COMMERCIAL AERONAUTICS
AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.
OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIRMEN.

No. 130, Nov. 24th, 1920: Customs Official in the County of Kent.
No. 131, Nov. 27th, 1920: Fixed Balloon at White City, London.

CIVIL AIRSHIP EXPERIMENTS.

The Air Ministry announced on Nov. 25th:—

The Department of Civil Aviation has agreed temporarily to take over all Airships, bases and material, surplus to service requirements, in order to carry out experimental work of an operational character, such as mooring-mast tests and flights of primary importance, to gauge the ships' capacity for commercial operation.

It is hoped that surplus airships will be ultimately handed over on approved terms to a private company to operate, and the results of these experiments and the knowledge and experience obtained will be available to any such company.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

NOVEMBER 22nd:

A.T.T., DH16, G-EALM, London-Paris, 13.12-15.50, G &M., Nil, Reeves.
M.A., Breguet, F-CMAB, London-Paris, 13.30-16.25, Nil, Nil, Le-Sec.
M.A., Breguet, F-CMAG, London-Paris, 13.51-16.30, Nil, Nil, Challoux.
I.A.L., "Vimy," G-EASI, London-Paris, 13.42-16.35, Nil, 2, Chattaway & 1.
G.E.A., "Goliath," F-GEAD, Paris-London, 11.45-14.10, G., 2, Labouchere & 1.
C.T., Nieuport, F-ICGT, Paris-London, 12.20-15.25, M., Nil, Mauler

NOVEMBER 23rd:

A.T.T., DH18, G-EAUF, London-Paris, 13.00-16.00, G.&M., 4, Armstrong.
C.T., Nieuport, F-ICGT, London-Paris, 13.45—, Nil, Nil, Mauler.
M.A., Breguet, F-CMAC, Paris-London, 12.55-15.00, G., 2, Martel.
A.T.T., DH16, G-EALM, Paris-London, 13.00-15.00, G., 4, Tebbit.
I.A.L., "Vimy," G-EASI, Paris-London, 13.40-16.05, G., 2, Chattaway & 1.

NOVEMBER 24th:

G.E.A., "Goliath," F-GEAD, London-Paris, 11.50-15.20, G., Nil, Labouchere & 1.
M.A., Breguet, F-CMAC, London-Paris, 12.17-15.50, G., 2, Martel.
A.T.T., DH16, G-EALU, London-Paris, 13.32-16.30, G.&M., 2, Milnes
A.T.T., DH18, G-EAUF, Paris-London, 13.10-15.07, G., 5, Armstrong.

NOVEMBER 25th:

M.A., Breguet, F-CMAB, Paris-London, 12.50-15.28, M., 3, Le Men.
Several machines other than the above attempted each end of route on Nov. 25th, but had to return owing to weather.

NOVEMBER 26th:

A.T.T., DH18, G-EARO, London-Paris, 12.40-15.30, G.&M., 3, Holmes.
M.A., Breguet, F-CMAB, London-Paris, 12.47-15.52, G., 3, Le Men.
H.P.T., DH9, G-EAUN, London-Paris, 13.55-16.25, G., Nil, McIntosh.
H.P.T., DH9, G-EAUN, Paris-London, 09.25-12.05, G., Nil, McIntosh.
G.E.A., "Goliath," F-GEAD, Paris-London, 12.28-14.46, G., 1, Favreau & 1.
A.T.T., DH16, G-EALU, Paris-London, 11.50-14.45, G., 3, Reeves.
S.N.E.T.A., DH9, O-BEAU, Brussels-London, 12.30-15.00, M., Nil, Delzenne.
M.A., Breguet, F-CMAG, St. Inglevert-London, 14.30-15.20, G., Nil, Challoux.

NOVEMBER 27th:

G.E.A., "Goliath," F-GEAD, London-Paris, 12.25-18.10, G., 2, Favreau & 1.
A.T.T., DH16, G-EALM, London-Paris, 12.33-15.25, G &M., 2, Forson.
S.N.E.T.A., DH9, O-BEAU, London-Brussels, 12.35-15.30, G.&M., Nil, Delzenne.
M.A., Breguet, F-CMAG, London-Paris, 12.40-16.15, G., 2, Challoux.
H.P.T., DH9, G-EATA, Brussels-London, 12.02-14.36, M., Nil, Fowler.
M.A., Breguet, F-CMAI, Paris-London, 12.35-14.35, M., 4, Martel.
M.A., Breguet, F-CMAB, Paris-London, 12.45-14.43, G., Nil, Le Sec.
H.P.T., DH4, G-EAVL, Paris-London, 12.47-14.34, Nil, 1, Foot.

NOVEMBER 28th:

A.T.T., DH16, G-EALM, Paris-London, 12.45 (landed Lympne), Nil, 4, Milnes.
A.T.T., DH18, G-EARO, Paris-London, 12.50 (landed Lympne), Nil, 7, Holmes

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

NOVEMBER 22nd:

H.P.T., DH9, G-EAUC, London-Paris, 11.55-15.05, G., 2, Helliwell.
H.P.T., HP, G-EATL, Paris-London, 12.40-15.50, G., 5, Olley & 1.

NOVEMBER 23rd:

H.P.T., HP, G-EAMA, London-Paris, 11.42-15.35, G., 5, McIntosh.
S.N.E.T.A., DH9, O-BELG, Brussels-London, 12.00-13.45, G.&M., 1, George
H.P.T., DH4a, G-EAVL, Paris-London, 13.05-15.07, Nil, 1, Foot.
H.P.T., DH9, G-EAUC, Paris-London, 13.10-15.18, Nil, Nil, Helliwell.

NOVEMBER 24th:

H.P.T., DH4a, G-EAVL, London-Paris, 11.57-14.50, Nil, 1, Foot.
S.N.E.T.A., DH9, O-BELG, London-Brussels, 12.52-15.35, Nil, G.&M., George.
H.P.T., HP, G-EATJ, Paris-London, 12.45-15.20, G., 4, Beal & 1.

NOVEMBER 25th:

S.N.E.T.A., DH4, O-BALO, Brussels-London, 11.55 (24th) (landed Epping 25th), 14.40, G.&M., Nil, Rigaud.

NOVEMBER 26th:

H.P.T., DH9, G-EATA, London-Brussels, 12.42—, Nil, 2, Fowler.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 12.47—, G.&M., Nil, Rigaud
H.P.T., HP, G-EAMA, Paris-London, —16.00, G., 7, Hope & 1.

NOVEMBER 27th:

Bad weather at Cricklewood. Machines operated from Croydon.

NOVEMBER 28th:

NIL.

Air Port Statistics.

Owing to bad weather, mists and fogs prevailing during the past week, the air lines to the Continent have been badly hampered, but not to so great an extent as the ground transport services.

CONTINENTAL

MACHINES:			
	Croydon 34	Cricklewood 13	Total 47
PERSONNEL.—Passengers:			
	Croydon 60	Cricklewood 25	Total 85
Crews:			
	Croydon 40	Cricklewood 17	Total 57

INLAND.

MACHINES:			
	Croydon 19	Cricklewood 8	Total 27
PERSONNEL (including one member of Crew per machine):			
	Croydon 40	Cricklewood 18	Total 58

Grand Total Machines 74 Grand Total Personnel 115

Inland Flying at Cricklewood.

Nov 22nd.—H.P.T., O/400 test (Brackley); BE2e test (Fowler).
Nov. 23rd.—Nil.
Nov. 24th.—H.P.T., DH9 to Aintree (Olley).
Nov. 25th.—I.A.L., "Bat" from Croydon and then to Lympne (for Paris), returned to Croydon owing to weather (Chattaway); H.P.T., DH9 from Aintree (Olley).
Nov. 26th.—Nil.
Nov. 27th.—H.P.T., O/400 (Jones), DH9 (Perry) to Croydon for Paris. Weather too bad to proceed.
Nov. 28th.—Nil.

Inland Flying at Croydon.

Nov. 22nd.—Nil.
Nov. 23rd.—A.T.T., DH9 2 tests (Milnes).
Nov. 24th.—P.L., Westland, Yeovil return (Keep). A.T.T., DH18, height test (Forson).
Nov. 25th.—I.A.L., "Bat" to Cricklewood (Chattaway).
Nov. 26th.—Nil.
Nov. 27th.—H.P.T., O/400 from Cricklewood (Jones). DH9 from Cricklewood (Perry). M.W.T.C., DH6 1 test (Lovell). L.A.S., Avro from Leatherhead (Muir). Avro, 8 joy-rides (Muir).
Nov. 28th.—Nil.

The London Terminal Aerodrome.

Nothing much of importance has happened at Croydon during the week. On Wednesday the International Wireless Commission visited the aerodrome in a huge fleet of cars, and after being shown the plant and the sheds by Major Greer were entertained to tea in the Trust House.

On the same day Mr. Forson made a fine high flight in the D.H.18. Without pushing the machine, he got up to 8,000 ft. in 16½ minutes, at which height he carried out certain tests. The machine, of course, has a much higher ceiling than 8,000 ft., but being a commercial machine she is not intended to work at a height much in excess of 5,000. Most machines on the Paris line completed their journeys in spite of the weather.

The Instone Air Line sent the "Vimy" to Paris on Monday. She returned on Tuesday, and on Wednesday Mr. Chattaway flew her to the Vickers Works at Brooklands to have new engines fitted. By the time these lines appear she should have returned to Croydon.

On Thursday the "Bat" went to Cricklewood to collect some surplus Handley Page passengers and started for Paris with them. When she got to Lympne the visibility was so bad that Mr. Chattaway was unable to see his wing-tips. He then cruised about trying to find the aerodrome, but the visibility was too bad and so he returned to Croydon. On looking at the weather reports he was surprised to note that the visibility at Lympne was said to be 2,000 yards.

On Saturday the weather consisted of selections of rain, Scottish mist, and fog. An 0/400 Handley Page came over from Cricklewood with Mr. Cogni aboard and had the misfortune to break a tail skid, whereupon Mr. Cogni telephoned to Cricklewood for a D.H.9 to take him on to Paris. Several machines came in from Paris in weather that looked impossible and made one feel decidedly improbable.

Meanwhile a nice new-looking Avro belonging to the Leatherhead Aviation Services was taking hardy passengers for joy-rides, and one congratulates both the pilot (Mr. Muir) and the passengers on this sporting display. As one was going home on the top of an inside-crowded tram, and when it was too wet to sit down and so unpleasant that one arrived home soaked, one saw the Avro still flying merrily. And yet there are still those who say that the British public are not enthusiastic over aviation!

It is understood that Mr. Chapman intends to bring the Avro to Croydon every week-end, also the D.H.6, for cheap joy-rides and, in addition, to entertain the onlookers with exhibition flying. So that with the "Dollar Princess," as the "Vimy" has been called, and the two Leatherhead machines Croydon will really be a most excellent place at which to spend fine Saturday and Sunday afternoons.—G. D.

Direction-Finding, as Done.

[The following letter, at once amusing and instructive, is the result of a brief conversation between the present writer and the "first mate" hereunder mentioned. It may be well to explain that, according to Air Ministry instructions, all phrases used on wireless telephones must be repeated three times to make sure that there are no interruptions by "atmospherics" or jamming. Mr. Marconi, wherever he operates, is very careful about this.—C. G. G.

Sir,—The First Mate of the good ship EAMA tells me you would like a report on how we used our wireless to find Croydon on Saturday (Nov. 20th) in the fog. I, the skipper, not having landed there since before the Armistice—except once, when I went up as passenger in a B.F. and landed on my head on the rubbish-heap there.

We left Paris 12.35 None of the Messrs. Marconi had anything interesting to tell us until we were crossing the Channel, when Mr. Marconi of Lympne told us we must land there on account of thick fog at Cricklewood. I said, "Damn"—"Damn"—"Damn." (Marconi repeat.)

Approaching Lympne, we proceeeded to meet it, when Mr. Marconi of Cricklewood said: "Fog clearing. Carry on" (three times). The First Mate gave me the 'phone and I grunted—grunted—grunted—and made for Cricklewood via North London.

Passing Maidstone, Mr. Marconi of Lympne was saying he didn't like my singing, when Mr. Marconi of Cricklewood interrupted him to say: "Thick fog at Cricklewood, proceed to Croydon." I shouted something—three times y'know. Mr. Marconi at Croydon didn't like it.

I changed my course. It doesn't matter which way I steered, as I didn't know exactly where Croydon was, but hoped to see the Crystal Palace—and the fog grew thicker and thicker.

We went on, not recognising anything, until by my watch we should have been somewhere near, so I told the Mate to ask Croydon to oblige us with a rocket, but instead—what do you think?—they told us where we were.

I couldn't understand at first. They said we were 80 deg. off Croydon. Then I remembered how we used to be shot down in the Big War when we got inside three listening-posts, and thought this must be the same sort of thing, so altered my course accordingly; and five minutes after we came plonk over Croydon.

It couldn't have been done better if they had thrown us a line. We landed at 3.10 *avec* five passengers and freight.

(Signed) THE SKIPPER.

When Trains are too Slow.

On Nov. 24th, owing to business, an American, Mr. George Millward, missed the boat train from London to Liverpool to catch the White Star Liner *Celtic*. He therefore went to Cricklewood and flew to Aintree in D.H.9 G-EATA, which incidentally was the first of the D.H.9s to fly on the Handley Page Transport Service. Piloted by Mr. Olley, the journey was made in one hour and a half, and Mr. Millward actually arrived on board the *Celtic* before the passengers from the boat train.

Leatherhead.

Mr. W. S. Chapman, of Leatherhead, now has an Avro as well as his D.H.6 (100-h.p. Curtiss), and on this former machine he has been doing a fair amount of cross-country flying. About a fortnight ago he went to Northampton, but on the return trip ran into fog and was compelled to land four miles north of Ampthill, Bedfordshire.

On Nov. 14th he had to go to Bournemouth on business. It was blowing a gale, the journey taking 2 hr. 20 min. A storm was run into just before reaching Southampton, which forced the machine down a few hundred feet. The return journey was made on the following day, also in a high wind, the trip taking just under an hour flying at 6,000 ft.

Mr. Chapman intends to carry passengers at Croydon every week-end at special cheap rates, using both the Avro and the D.H.6. Last Saturday he was there, but owing to the weather he only carried 16 passengers—just sufficient to pay for the reduced landing fee. He will use the D.H.6 for short passenger flights, the Avro for longer flights and stunting if necessary, and it is also his intention to give during the course of the afternoon, assuming that there are sufficient people present, short exhibitions of real stunt flying.

Mr. Chapman has two first-class machines in faultless condition, the D.H.6, in particular, having had many modifications made on it, more particularly with regard to the comfort of the passenger, and also a very skilled pilot, so that it is hoped that his enterprise in coming up to Croydon on week-ends will be well supported by all those who wish to have passenger flights.

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

New South Wales Aerial Derby.

In what was known as the first New South Wales Aerial Derby, held on Saturday, Nov. 27th, Capt. G. C. Matthews, A.F.C., flying a Sopwith "Gnu," covered the 64-mile course from Mascot to Richmond and back—a distance of 64 miles—in 42 min. 54 sec. Lieut. Love (110-h.p. Le Rhône Avro), finishing first, won the handicap

5,000-Mile Trip.

At 11.30 on Oct. 18th one of the Australian Aircraft and Engineering Co., Ltd., Avro aeroplanes, piloted by Lieut. N. B. Love, arrived safely at Mascot Aerodrome from Newcastle, this being the last stage of a 5,000-mile tour organised by the company on behalf of Lewis Berger and Sons, Ltd.

This trip is the most extensive commercial enterprise of its kind carried out in Australia. The passenger throughout the journey was Lewis Berger's representative, Mr. A. McMillan, whose plan was to visit a great number of towns within a specified time.

The machine left Mascot on Sept. 7th, making Goulburn the first stop, thence to Wagga, Cootamundra, Albury, along the Murray to Deniliquin in the south-west. They then went north to Hay, and from there visited all the chief western towns, notably Ardlethan, Temora, Wyalong, Forbes, Parkes, Mudgee and Dubbo; from there to Gilgandra, Coonamble, over the Pilaga scrub, to Narrabri. The machine proceeded thence to Moree, Inverell, Glen Innes, Tenterfield. The flight was then made across the ranges to the coast, visiting Casino, and north to the Tweed River on the Queensland border. A start was made south from there to Lismore, Ballina, Grafton. The ranges were again crossed to Glen Innes to follow all the towns on the Northern Railway line, including Armidale, Muswellbrook, Singleton and Newcastle, which was reached on Monday afternoon.

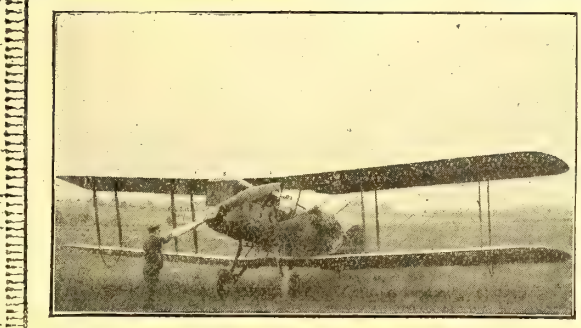
"The most notable feature of the trip was that the machine arrived within a quarter of an hour of schedule time, which time-table was drawn up two months ago. This fact reflects great credit upon the reliability of modern aircraft."

Mr. Love stated that "the country throughout the whole of the State presents a veritable vale of prosperity throughout. In Coonamble the machine landed in the racecourse, and it was found impossible to get out again on account of the height of the clover; the same thing applied to Tamworth, and it was necessary to mow a track through the long grass before the machine could take off.

At each town the pilot took on the duty of lecturer to the public school children by arrangement with the Minister for Education, to explain to them the general principles of flying and the facilities of fast travelling.

At every town a number of complimentary tickets were distributed, and the business enterprise of the young Australian was clearly demonstrated at Forbes, where Mr. McMillan inadvertently let go the envelope containing the four free

The "Bristol" Aeroplanes



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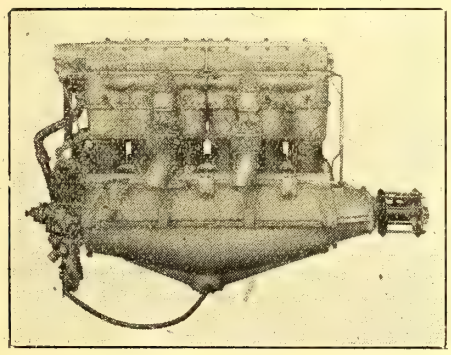

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flight tickets for the town. A small boy picked up the envelope, kept one ticket himself and sold the remainder for a shilling each. The following morning four small barefooted boys came along for their cheap joy-rides, presenting their claims. All four were put into the back seats together, and they had their expectations fulfilled, much to their delight.

England to Australia in a D.H.9.

A few more details are to hand concerning the flight of Lieuts. Parer and McIntosh from England to Australia in a D.H.9 (240-h.p. Siddeley "Puma"). With regard to the attack by armed Arabs when they were forced to land in the Syrian Desert, it has been stated the Arabs were in such a bad physical condition that they had not the heart for a bold attack and were easily bluffed. A far worse plight befell them in Calcutta, where their financial resources came to an abrupt end. By judicious use of a little sympathetic publicity in covering their machine with small posters stating their difficulties, enough funds were collected to carry them on a bit farther.

On approaching Moulmein various difficulties seemed to crop up at once. The exhaust pipe developed a fracture so that the hot exhaust gases were blowing right in the faces of the aviators. One of the oil pipes was broken by friction so that the bearings were nearly running. It was feared that a landing would have to be made in the sea, so improvised lifebelts were made out of some spare inner tubes. The race-course was covered with excited natives, so that there was very little chance of making a landing. A message was dropped asking that a clearing should be made for them and that everyone should be kept well away as there was a danger of the machine blowing up upon landing. A corner was cleared, but although it was seen to be too small it was decided to risk it. In landing, the undercarriage was smashed, the wheels being pushed through the bottom plane, the petrol tank badly damaged, and the airscrew was broken beyond repair. A Caproni propeller was obtained from an Italian machine engaged on the Rome-Tokio flight, and though not suitable, it was bushed up to make it fit. Two motor car radiators were fitted and the undercarriage patched up sufficiently to carry them to Sourabaya, where there was a further crash caused by an unseen ditch on the landing ground.

Fortunately, the Dutch Flying Corps use D.H.9s in that region, and as had been stated by Capt Sir Ross-Smith and Capt. E. C. Matthews, both of whom spoke very highly of the courtesy of the Dutch Flying Corps, every facility was placed at their disposal by the Dutch Commandant there. Consequently in three days the machine was sufficiently patched up to enable it to make Darwin.

The only part of the machine that was intact on its arrival at Sydney was the 240 h.p. Siddeley "Puma" engine, and, as may be expected, Lieuts. Parer and McIntosh are loud in their praise of the satisfactory manner in which the engine carried them through their flight of eight months' duration. The only trouble met with was caused by either faulty carburation or inferior petrol. The only repair needed was the replacing of a broken valve spring; truly a record of which Armstrong-Siddeley Motors, Ltd., may well be proud.

Owing to the exposure to all sorts of weather for eight months the fabric was in a very bad condition and was only kept together by the repeated coats of dope it has received. They met with a huge reception on their arrival at the Australian Aircraft and Engineering Company's aerodrome at Mascot, Sydney, fully 15,000 people having gathered there, together with the Mayor and Municipal Council of Mascot, and Commander Allison, who represented Sir Walter Davidson, the State Governor.

HONG KONG.

A correspondent in China writes :—

The Hong Kong Aero Club.

A meeting of the Hong Kong Aero Club was held on July 9th at the office of Jardine Matheson and Co., Ltd., at which there was a good attendance. The Hon. Mr. P. H. Holyoak presided.

Opening the meeting, the Chairman said a meeting had been held on April 20th last, when a provisional committee with a provisional chairman, Captain Arthur, was elected, to consider the best form in which to start the Club, and what objects it should have chiefly in view. The report read as follows :—

The objects of the Club are :—

1. To encourage and develop the sporting side of aviation in the Colony.

2. To take control when necessary of the sporting side of aviation in the Colony.

3. To affiliate with the Royal Aero Club, and to act as the official representative of that body in the Colony.

4. To request the Government to allow an area of water to be definitely chosen for the landing of aircraft in the vicinity of the town when necessary, and to have the site left clear and available for the machines when necessary.

5. To appoint a committee to deal with the following matters : Technical, i.e., such as assistance to arriving and departing aircraft and dissemination of information on the conditions governing flying around the Colony, also to reply to the letters sent to the Government by the Aero Club of America which have been passed on to the Aerial Club to reply to, and give any assistance and advice to members who desire to purchase and use aircraft.

THE FORMATION OF A VOLUNTEER AIR FORCE.

To this should be added the formation of a Volunteer Air Force. There were a certain number of Royal Air Force pilots in the Colony, and he thought it was quite fitting that they should approach the Government with a view to forming a Volunteer Air Force, and ask them whether, in view of the necessity for such a Force, it was not willing to provide the necessary aeroplanes and aerodromes in order that the greatest use might be made of the practical air pilots with war experience. He did not think there could be a shadow of doubt in the minds of anyone who had followed the course of the war that this Colony, as far as its own protection went, was more or less unprotected, and that the future of its protection lay more or less in the air. At present it was dependent on its water and land forces. That was more or less admitted. Therefore, the Club would be doing a very practical thing in the way of Empire development if it impressed not only on this Government but the Home Government the absolute necessity of air protection, not only to meet air aggression but to keep it away, which was very important. With a strong force of submarines and with air protection he thought there was little doubt that this Colony could be protected against aggression whilst assistance was coming.

THE ELECTION OF OFFICERS.

The election of officers resulted as follows :—

Patrons : His Excellency the Governor, the General Officer Commanding, the Admiral and the Commodore.

President : Hon. Mr. P. H. Holyoak.

Vice-Presidents : Hon. Mr. John Johnstone, Hon. Mr. A. R. Lowe, Hon. Mr. N. J. Stabb, Mr C. H. P. Hay.

General Committee : Group Captain F. V. Holt, C.M.G., D.S.O., R.A.F., Dr. G. M. Harston, Messrs. L. N. Leefe, O. T. Breakspear, D. K. Blair, N. L. Watson, A. O. Lang, C. Montague Ede, J. A. Plummer, E. W. Carpenter, J. Bell Irving, F. Smyth, G. M. Young, Hon. Mr. E. V. D. Parr, Messrs. F. C. Hall, G. M. Dodwell, G. S. Archbutt, P. M. Hodgson, J. L. Crockatt, Lt.-Col. H. S. S. Smallwood, Messrs. E. F. Carroll, G. Miskin, C. Blaker.

Executive Committee : Captain. D. Arthur, Messrs. A. G. Lamplugh, A. I. Burnie, M. H. Turner, R. M. Smith, E. H. O. Farrell, G. A. Harriman.

Hon. Secretary : Mr. O. T. Breakspear.

Hon. Treasurer : Mr D. K. Blair.

The Chairman said the Committee would frame a constitution and submit it to a meeting as soon as possible. They might suggest to the Committee that the authorities be approached to secure a revision of the regulation 150 ft. height limit for flying. The Government might be asked to fix a more reasonable limit, one that at any rate would allow an aeroplane to clear any vessel anchored in the harbour.

The Chairman said the Committee would reply to the long letter from the Aero Club of America and to a letter from Peking asking the Club to recommend qualified pilots to them for the Handley Page machines brought out or now on their way. In Peking there had been extraordinarily rapid development in flying, as Mr. Lamplugh would tell, and personally he saw no reason why it should not spread to the South. The commercial possibilities of flight between Canton and here might attract them, though the prospects of mail and passenger air service between here and Shanghai seemed a matter for the future.

FOREIGN INTELLIGENCE.

UNITED STATES OF AMERICA.

The Pulitzer Trophy.

The race for the Pulitzer Trophy was held at Mitchel Field, L.I., on Thanksgiving Day, Nov. 25th, and resulted in a win for Lieut. Mosley, flying a Verville-V.C.P. Racer (550-h.p. Packard engine).

The prizes include the Pulitzer Trophy, which will be competed for annually; gold, silver and bronze plaques, and Liberty Bonds to the value of 5,100 dols., awarded to pilots gaining the first, second and third places in various classes, one-fifth of the prize awarded to the pilots going to the mechanics in charge of the machines. The race was held over a triangular course of roughly 35 miles, which had to be covered four times. Two machines wrote themselves off in a collision on the ground before starting, but otherwise the meeting was devoid of thrill. A huge crowd witnessed the race, despite threatening weather.

It is reported that the winner covered the course in the unofficial time of 44 min. 29.57 sec., which works out at something like 190 miles an hour.

Further particulars of the race will be given on the receipt of more reliable information from America.

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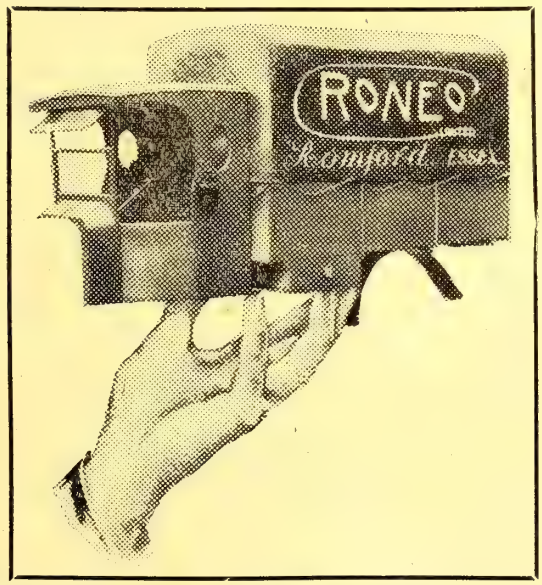

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AIRCRAFT IN PARLIAMENT

Nov. 22nd.—The following written answer was given:—

IMPERIAL DEFENCE.

In reply to Mr. J. DAVIDSON, Mr. LLOYD GEORGE said the Committee of Imperial Defence decided to set up a Standing Committee of the Committee of Imperial Defence with himself as *ex officio* in the chair, having as members the First Lord of the Admiralty, Secretary of State for War, the Under Secretary of State for Air, the First Sea Lord, the Chief of Imperial General Staff and the Chief of the Air Staff, to discuss such questions as might from time to time be referred to it by the Committee of Imperial Defence.

* * *

Nov. 23rd.—The following oral answer was given:—

ROYAL AIR FORCE—MONTHLY RATE OF EXPENDITURE (NEAR EAST).

Mr. CHURCHILL, in reply to Mr. GALBRAITH, Mr. KILEY, and to interpellations by Sir THOMAS BRAMSDON and Mr. TREVELYAN THOMAS, said that the monthly rate of expenditure for the Air Force in the Near East is approximately as follows:—

Mesopotamia, £82,000; Constantinople, £4,000; Egypt, £80,500; Palestine, £18,250.

* * *

Nov. 24th.—The following written answers were given:—

ROYAL AIR FORCE—NAVY AND ARMY AIRMEN.

Replying to Major GLYN, Mr. BONAR LAW, for the Prime Minister, said that as expressed in the Notes on Naval Policy circulated with the last Navy Estimates, it was not the intention of the Admiralty to return to the system of a separate Air Service, the same view was taken by the Army Council.

IMPERIAL AIR SERVICE

Replying to Major GLYN, Mr. BONAR LAW, for the Prime Minister, said that there was a distinct separate future for the Royal Air Force, apart from its co-operation with the Navy and Army. The expense and duplication of work in the R.A.F. had been justified by results. The Committee of Imperial Defence, had, as yet, had no opportunity for consideration of the future of an imperial air service and co-operation.

* * *

Nov. 26th.—The following written answer was given:—

ROYAL AIR FORCE.—ESTABLISHMENT.

In reply to Major Glyn, Mr. CHURCHILL submitted the following particulars:—

1. The total strength of the R.A.F. on Oct. 1st, 1920, was as follows:

Officers	2,812
Other ranks	23,862

2. Numbers authorised in Air Estimates for the year 1920 to 1921 were as follows:—

Officers	3,059
Other ranks	26,519

These figures include provision or personnel whose demobilisation had not been effected at the commencement of the financial year.

3. A scheme has been agreed between the Air Council and the Army Council whereby officers will be seconded from one Service to the other. A certain number of Army officers have already been seconded to the R.A.F.

4. Junior Army officers will be seconded for four years, but senior officers will be attached for short periods only

5. It is proposed to form a Reserve for the R.A.F., and detailed regulations concerning training are already well advanced.

6. The Reserve will be drawn from the following sources:—

(a) Officers holding short service commissions who have completed their period of service on the active list, and permanent officers of the R.A.F. who may be permitted to retire or relinquish their commissions before reaching the compulsory retirement age of their rank.

(b) Officers who, by the conditions of their entry into the R.N.A.S. or R.F.C., have a period of service in the Reserve to complete, and who may be allowed to complete such service in the R.A.F. Reserve.

(c) A limited number of flying officers who have returned to civil life after service during the war.

(d) Medical officers.

(e) Other ranks who have completed their engagement with the regular Royal Air Force.

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

Air-Marshal Sir Hugh Trenchard will preside at the next meeting, which will take place at the Royal Society of Arts, John Street, Adelphi, on Thursday, Dec. 2nd, when two papers will be read: "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C., and "Airship Mooring," by Flight Lieut. F. L. C. Butcher, R.A.F.

At the following meeting on Thursday, Dec. 16th, Mr H. Ricardo will read a paper on "Possible Developments in Aircraft Engines," to be followed by "The Installation of Aeroplane Engines," by Mr. A. J. Rowledge.

BINDING CASES FOR THE JOURNAL.

Arrangements have been made for the binding of complete sets of the Journal for 1920 in blue cloth cases with gilt lettering at a charge of 4s. 6d. per volume, including the supply of the case. Members who desire to take advantage of this arrangement should forward their sets direct to the Lewes Press, Ltd., High Street, Lewes, at the same time sending a remittance for 4s. 6d. to the Secretary at the Society's Offices. A note stating the name and address of the sender should be enclosed in the parcel to the binders. The complete volumes will be returned direct to members, postage paid.

LIST OF MEMBERS.

A new List of Members, corrected up to Oct. 31st, is now available, and copies will be sent to members on request.

FINANCE.

The Balance-sheet and Income and Expenditure Account for the six months ending June 30th, 1920, have now been adopted by the Council. They show a deficit on the six months' working of £277.

LIBRARY.

The following book has been received and placed in the Library of the Society: "History of 99 Squadron, R.A.F.," by Squadron Leader L. A. Pattinson.

W. LOCKWOOD MARSH,
Secretary.

Nov. 27th, 1920.

THE AIR LEAGUE AT CAMBRIDGE.

On Nov. 10th the Air League of Great Britain held a meeting at Cambridge. Major-General J. E. B. Seely, C.M.G., D.S.O., M.P., and Lieut.-Colonel J. T. C. Moore-Brabazon, M.C., M.P., both addressed the meeting.

R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR FORCE.

AIR MINISTRY, Oct. 5th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—Flying Officer C. H. Arnison is placed on the Retd. List owing to injuries, and is permitted to retain his rank, Oct. 6th.

FLYING BRANCH.—Flight Lt. V. A. H. Robeson, M.C., is placed on the half-pay list (Scale B), from Nov. 8th, 1919, to May 31st.

ADMINISTRATIVE BRANCH.—Flying Officer (actg. Flight Lt.) H. G. Jones to be actg. Sqdn. Ldr. whilst empld. as Sqdn. Ldr., Sept. 18th.

Flying Officer C. L. P. Mullany to be actg. Flight Lt. whilst empld. as Flight Lt., Sept. 18th.

AIR MINISTRY, Oct. 8th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The following are granted permanent commns. in the ranks stated:—Flight Lt. T. Gran, M.C., Sept. 22nd; Flying Officer C. W. Attwood, Aug. 1st, 1919.

Wing Comdr. J. W. O. Dalgleish, O.B.E., is placed on the Retd. List on account of ill-health contracted on active service, and is permitted to retain his rank, Oct. 9th.

Observer Officer the Hon. M. H. R. Knatchbull, M.C., is placed on the Retd. List on account of ill-health contracted on active service, and is granted the rank of Flight Lt., Oct. 1st. (Substituted for notification in "Gazette," Sept. 28th.)

ROYAL AIR FORCE MEDICAL SERVICE.—The following are granted permanent commns. in the ranks stated:—Wing Comdr. D. Munro, C.I.E., M.B., Dec. 4th, 1919; Sqdn. Ldr. W. Tyrrell, D.S.O., M.C., M.B., Oct. 1st.

SHORT SERVICE COMMISSIONS.—The following officers are granted short service commns. in the ranks stated, with effect from the dates incidated, retaining their seny. in the substantive rank last held by them prior to the grant of this commn., except where otherwise stated:—

Sqdn. Ldr.—C. Draper, D.S.C., Sept 27th.

Flying Officers.—J. Buckley, Oct. 4th; A. C. Heaven, M.C., Sept. 30th; H. B. Pett, M.C., Oct. 4th; W. J. Rivett-Carnac, M.B.E., Oct. 1st.

Observer Officer.—F. Thomasson, D.F.C., M.M., Oct. 24th, 1919. (Substituted for notification in "Gazette" of that date.)

Flying Officers (from Pilot Officers), with seny. of the dates indicated.—D. L. Blackford, Sept. 13th. (Substituted for notification in "Gazette," Oct. 1st.) R. W. F. Dunning, Oct. 6th; R. N. Hesketh, Aug. 26th. (Substituted for notification in "Gazette," Sept. 14th.) C. E. Usher-Somers, Sept. 29th; L. T. Wilson, Sept 29th.

AIR MINISTRY, Oct. 12th.

ROYAL AIR FORCE.—SHORT SERVICE COMMISSIONS.—CHAPLAIN'S BRANCH.—Rev. M. J. Eland is granted a short service commn., with the relative rank of Sqdn. Ldr., Oct. 8th.

ADMINISTRATIVE BRANCH.—Flying Officer J. M. J. C. J. I. Rock is restored to the active list, Oct 11th

TECHNICAL BRANCH.—G. M. Cox is granted a temp. commn. as Flying Officer, June 24th.

MEDICAL BRANCH.—The following Serjt.-Majs., Class 1, are granted permt. commns. as Qrmrs. (Medical), with hon. rank of Flying Officer; 187485 C. B. Willsher, Aug. 1st, 1919; 302630 W. Gamblen, July 1st; 301542 F. W. Goodread, Sept. 1st.

CHAPLAINS' BRANCH.—Rev. A. A. Crawshaw, M.A., relinquishes his commn., and is permitted to retain the title of Hon. Chaplain to the R.A.F., Oct. 12th.

AIR MINISTRY, Oct. 15th.

ROYAL AIR FORCE.—Short Service Commissions.—Flight Lt. D. L. Ingpen is granted a short service commn. in rank stated (Oct. 11th).

AIR MINISTRY, Oct. 19th.

ROYAL AIR FORCE.—TECHNICAL BRANCH.—Pilot Offr. I. F. A. Klapper to be Flying Officer without pay and allowances of that rank (April 25).

AIR MINISTRY, Oct. 26th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The notification in "Gazette" of Aug. 1st, 1919, appointing Lt. O. S. Waymouth to a permanent commn., is cancelled.

The surname of Flying Officer W. Elliot, D.F.C., is as now described, and not as stated in "Gazette" of Aug. 1st, 1919.

SHORT SERVICE COMMISSIONS.—The following officers are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their seniority in the substantive rank last held by them prior to the grant of this commn., except were otherwise stated:

Flight Lt.—D. H. Dabbs, Oct. 19th.

Flying Officers.—G. V. Carter, Oct. 19th; C. H. Cahill, Oct. 15th; P. R. T. J. M. I. C. Chamberlayne, A.F.C., Oct. 9th (previously described as P. R. T. Chamberlayne); L. L. Lelen, Oct. 13th; H. S. Sandiford, Oct. 7th; G. S. Smith, Oct. 18th; S. F. Vincent, A.F.C., Oct. 19th; J. E. H. Littlewood, Oct. 12th.

Flying Officers (from Pilot Officers).—With seniority of the dates indicated:—C. Sagon, C. R. L. Shaw, A. Turner, M.M., Oct. 12th.

The correct names of the following Flying Officers are as now described, and not as stated in "Gazettes" of the dates indicated:—Macdonald Goodall, David D'Arcy Alexander Greig, Sept 12th, 1919; Francis Herbert Donald Henwood, D.F.C., Dec 5th, 1919; Edmund Cronin Usher-Somers, Oct. 8th

Observer Officer G. L. Nicholson resigns his short service commn., Oct. 1st. (Substituted for notification in "Gazette" of Oct. 1st.)

Flying Officer J. A. H. Savage is transferred to the Reserve, Cl. B, Oct. 23rd

FLYING BRANCH.—Pilot Officer to be Flying Officer:—A. G. Ellis, May 21st.

TECHNICAL BRANCH.—Pilot Officer to be Flying Officer:—G. Lambourne, Oct. 1st, 1919.

MEDICAL BRANCH.—Flying Officer to be Flight Lt.:—T. H. K. MacLaughlin, Aug. 7th.

PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]

ENGAGEMENTS.

BRYANT—PROUT.—The marriage of Flight Lieut. Walter E. G.

Bryant, R.A.F., with Miss Sybil Mary Prout, will take place at St. Mark's, North Audley Street, W., on Tuesday, Dec. 14th, at 2.30 p.m. There will be no reception, but the presence of friends at the church will be welcome.

LEFROY—ELTON.—An engagement is announced between Christopher Benjamin Henry Lefroy, late R.F.C., eldest son of C. B. L. Lefroy, of Vernon, British Columbia, Canada, and nephew of the Provost of Queen's College, Oxford, and Angela, daughter of Mr. and Mrs. E. F. Elton, of Burleigh Court, Gloucestershire, and late of Wellington College, Berkshire.

MARRIAGE.

KNIGHT—ATKINS.—On Nov. 20th, at the Church of St. Vincent de Paul, Altenburg Gardens, Lieut. Walter Frederick Knight, R.A.F., second son of F. E. Knight, Esq., of Purley, was married to Constance Mary, second daughter of F. T. Atkins, Esq., of 123, Lavender Hill, S.W.

BIRTHS.

BLACKFORD.—On Nov. 22nd, at 76, Clarkehouse Road, Sheffield, to Shiela, wife of Flying Officer J. Blackford, A.R.I.B.A., R.A.F.—a son.

BLAKE.—On Nov. 21st, at Limpsfield, to Major and Mrs. W. T. Blake—a daughter (Betty Eileen).

COLEMAN.—On Nov. 18th, at Woodlands, Tunbridge Wells, the wife of Capt. Coleman, R.A.F., of a son.

MILLER.—On Nov. 4th, at Calgary, Alberta, Canada, Enid Clare, the wife of Captain Leonard Miller, late 55 Squadron and Headquarters, R.A.F.—of a daughter.

WAKEFIELD.—On Nov. 18th, at 4, Honeyhill, the wife of W. W. Wakefield, R.A.F., of a daughter.

COMING EVENTS.

DECEMBER.

1st, Wed.—Westgate-on-Sea Seaplane Base and R.A.F. Manston Dinner at Holborn Restaurant. Particulars from Mr. T. S. Setterfield, 1, Cuthbert Road, Westgate-on-Sea.

2nd, Thurs.—R.Ae.S. lecture. "Airship Mooring," by Flight Lt. F. L. C. Butcher, and "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C.* Chairman, Air Marshal Sir Hugh Trenchard.

11th, Sat.—Armament School, Uxbridge. Dinner at Holborn Restaurant at 7.15. Hon. Sec. at 32, Old Jewry, E.C.
27th Sqd. Dinner at Criterion Restaurant. Particulars from Mr. E. L. Raworth, Lenzie House, East Parade, Harrogate.
104 Sqdn. Reunion Dinner at the Connaught Rooms, W.C.2. Particulars from Mr. C. G. Jenyns, Services Club, W.1.

16th, Thurs.—R.Ae.S. lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Installation of Aeroplane Engines," by A. T. Rowledge.*

18th, Sat.—Felixstowe Air Station Reunion Dinner at the Connaught Rooms, W.C.2, at 7 p.m. Particulars from Mr. W. Kitson, 22, Manor Terrace, Felixstowe.

JANUARY—1921

1st, Sat.—No. 41 Squadron's Dinner at Oddenino's. Particulars from Flight Lt. K. C. Leask, Hillingdon House, Uxbridge.

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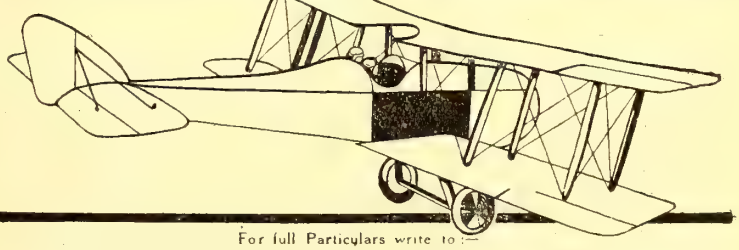

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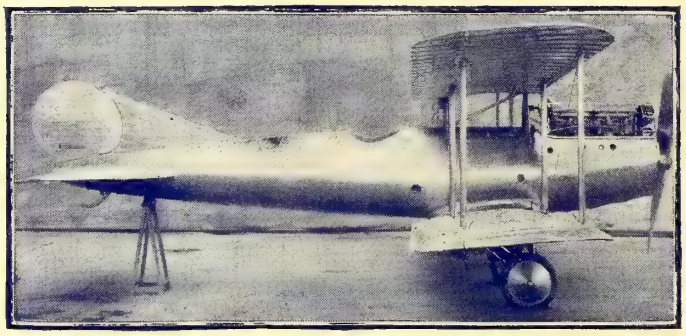

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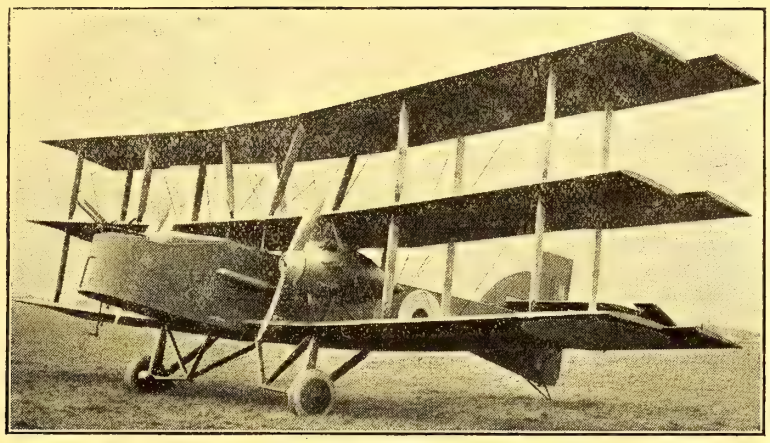

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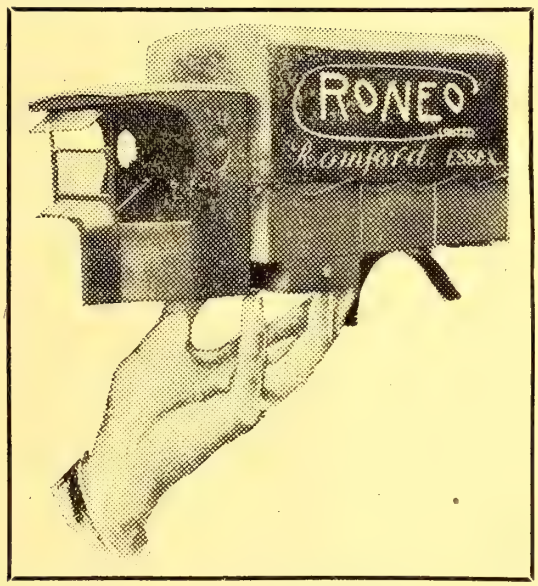

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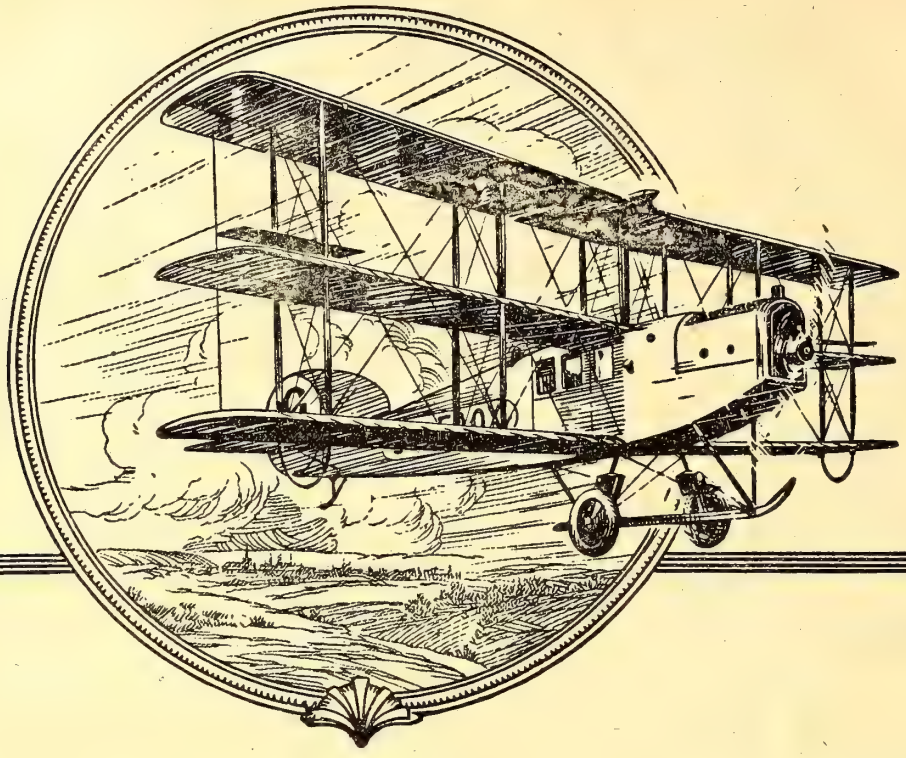

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ON SOME INTERNATIONAL AFFAIRS.

It has long been the custom of one or other of the so-called "Great Powers," when a minor Power has been equipping its army or navy, to send a military or naval mission to that minor Power to train its army or navy in the way it should go. Thus the Japanese Army was trained many years ago by German officers and the Japanese Navy was trained by British officers. Similarly the Chilian and Brazilian and Greek Navies were trained by British officers, the Turkish Army and the Bulgarian Army were trained by Germans, the Greek Army and the Serbian Army by the French, before the Balkan War of 1912, and so forth

The scheme, when originated, was not entirely disinterested. It was to be assumed that an army trained by German or French officers would be pro-German or pro-French, as the case might be, and that a Navy trained by British officers would be pro-British. Moreover, an army trained by Germans might reasonably be expected to buy its matériel in Germany and a navy trained by British officers might, equally reasonably, be expected to buy its ships and their equipment and supplies in England.

Naturally the minor Powers concerned chose for themselves which army or navy they would imitate, and so it was part of the duty of each naval or military attaché at the court of each such Power to persuade the chiefs of the country to which he was attached that his was pre-eminently the navy or the army which was best worth imitating. It is believed that in some unmoral countries that form of persuasion commonly called "graft" was used to convince Ministers of State, courtiers, and other persons of influence that this or that country's army or navy was undoubtedly the model for the world.

Of course, we British, being a wholly moral and honest people, never used such methods of persuasion. But we have always been noted among other nations for achieving our ends in our own peculiar ways, which, because they are not understood by our competitors, have earned for us the name of *"perfide Albion,"* among others. It is not so much that we design our methods to deceive other people. It is in fact that we deceive ourselves, and that being so it follows that other people are still more utterly deceived.

This system or lack of system is very similar to that which operates when we declare a protectorate over some entirely savage country and send missionaries by the dozen to convert it, with the result that we acquire the whole of that country's trade in spirituous liquors and glass beads in exchange for ivory, frankincense and myrrh, to the value of a thousand per cent. or so profit in return.

Air Missions.

That, however, is merely by the way, as explaining how nations less favoured than the Great Powers so recently at war have in the past arranged for the proper training and equipment of their armed forces, and as introducing to the notice of such as may be concerned the fact that these same less favoured nations are now equipping themselves with Air Forces on very similar lines.

In this instance Germany is rather out of the running, in that the German Aircraft Industry is not permitted to build aircraft of war. And, moreover, as Germany has been officially, if not actually by bodily contact, at war with practically every nation in the world which is capable of buying aircraft, it seems unlikely that for a year or two at least German instructors will be popular with any air force which would be worth training. The only exceptions are Holland, who builds her own aeroplanes, Spain, who prefers French and British aircraft, and the Scandinavian countries, which are not disposed to prepare for war, and will doubtless be over-run by the troops of the coming great Russian leader about ten or twelve years hence.

Germany and the Bolsheviks.

It is true that Germany is accused of equipping and training the air force, such as it is, of the Bolsheviks in Russia and the Kemalists in Turkey, but one has too much respect for the intellects of the sound business men who now run the German Government and what is left of the German Army to believe that any machines or men which have gone to Russia have been sent there with official approval Those in authority in Germany know perfectly well that Russia is still, as before the war, Germany's real enemy, and the one real peril to European civilisation.

Those German aviators who are directing the Bolshevik air work are probably merely German officers or men who stayed behind in Russia when Germany's victorious Eastern armies were withdrawn after the downfall in the West. It seems only natural that professional soldiers and aviators should prefer to stay where there is still a war in progress and pay to be drawn, or loot to be had, instead of coming home to be demobilised in a defeated country where food and pay and work are difficult to obtain.

And equally naturally others who did go back to Germany thought it worth while to return to or go to Russia, and try their luck as soldiers of fortune fighting against, or teaching Russians to fight against, their old enemies the British, French and Poles, instead of stopping at home and becoming that most pathetic of all objects, a professional soldier out of work. If things had gone the other way, and if Koltchak, Denikin, Wrangel and company had not each in turn proved to be an abject wash-out there would have been not dozens but hundreds of British and French aviators serving with them as soldiers of fortune, so one sees no reason to blame German aviators for serving with the Bolsheviks. A man must ply his trade somehow, even if only as a "Black-and-Tan" trying to dragoon Irish peasants into abject submission.

Moreover, if the Inter-Allied Aeronautical Commission keeps on upsetting German production of commercial aeroplanes on the plea that they might be used for war purposes—as for example the big Zeppelin monoplane, which would be useless as a bomber without an escort of fighters, which Germany may not produce—then of course German aviators and mechanics and designers must go to one of the two great areas of strife, either Russia or America, and Russia is nearer.

French and Italian Activities.

Germany being out of the way, so far as the rest of the world is concerned, it follows that France and Italy, the only two other countries which can design and construct aircraft of war, and know from actual war experience how to train an air force, have been very busy sending military aeronautical missions all over the world, chiefly to the South American nations. In some countries, for example in Argentina, France has acquired a strong hold. The Argentine Air Service is, one hears, being trained on the lines of the French Service d'Aviation Militaire, and is shaping very well indeed.

Both the French and Italian Governments have been very generous in presenting specimens of their war machines to foreign Governments. In fact there can be but few States which do not now possess free samples of the products of both nations.

Great Britain, on the other hand, has done very little in this way. Believing that charity begins at home we have presented some hundreds, possibly a thousand or so, of our surplus war machines to the British Dominions Overseas, some of whom do not seem to know what to do with them now they have got them. Canada appears to be the only really active Dominion, so far as aviation is concerned, and if the Canadian Air Board will arrange a few more flights from the Atlantic to the Pacific, and *vice versa*, they may use up all their gift machines in the next few months and so may begin to buy new and modern aeroplanes and seaplanes.

Our Merchant Venturers.

The only foreign nation to which an aviation mission has been sent since the war is Greece, and that was, presumably, rather because we wanted the Greeks to carry on for us in Asia Minor the war for which British Labour refuses to pay in the interests of the World's peace, than because we had any hopes of doing any actual trade in aircraft with Greece.

Instead of sending official R.A.F. missions to foreign nations we trusted, as usual, to our merchant venturers, much as we did in Queen Elizabeth's days when the merchant venturers

of the period enriched themselves by plundering the King of Spain's official galleons on their way home from the Indies. So far our merchant venturers do not seem to have enriched themselves mightily, but there is still time.

The Airco's various missions to foreign countries all came to an untimely end, owing to the new directors of the Aircraft Mfg. Co., Ltd., ceasing to take an interest in the manufacture of aircraft. The men who went on those missions are now either home again sadder and wiser, or they are carrying on by themselves, doing hack-flying.

Certain of the Handley Page missions seem to have gained a footing in foreign countries, notably in China and Brazil, but one hears little of the South African mission, and of the Indian there has recently been a tale of a freak wedding in a Handley Page machine, but that is all of late.

Perhaps the old original Handley Page missions are marking time pending the putting into full operation of the Aircraft Disposal Co., Ltd. This was indeed a wily move on the part of the firm and of the Ministry of Munitions alike, for it leaves a purely commercial firm perfectly free hands to do business with foreign nations by ways and means which would be too active for a Government Department. Here one sees at any rate a chance for the merchant venturer to outmanoeuvre the craft of foreign Governments. And, so far as one can hear, the Aircraft Disposal Co. is actually doing quite big business in many countries.

The Avro Company have done well in Australia and in Bermuda, with the help at the latter place of the Beardmore Co. and the Supermarine Co. But little has been heard of Avros, in foreign countries, except in the hands of private individuals.

The Japanese Affair.

Nevertheless, though merchant venturers may sell aeroplanes to foreign countries, that is not the same thing as getting a hold over the whole of a nation's air force by sending our own officers and men to train the personnel and make the whole force pro-British. It seems to be here rather than in the sale of machines that our Government has missed its opportunities.

For example, it is commonly known that we had promised to send a big mission of R.A.F. officers and men to Japan to train particularly the Japanese Naval Air Service. Lately it has become equally commonly known that all the arrangements had been cancelled, and that the mission, which was all complete and ready to start, was to be completely washed out.

Common rumour has it that our cousins in the United States represented that it would be an unfriendly act for us to train to our own high standard of efficiency the naval personnel of the one and only nation which might conceivably make itself unpleasant to the States on the Pacific Coast.

Weak Cases.

This seems rather an admission of weakness on both sides, if true. In the first place it seems to be admitting weakness in the U.S. Naval Air Service if the States are afraid that Japan may become so powerful as to be any real danger to so great a people as the Americans. In the second place it seems still weaker on our part if we complied with the request without some compensating advantage.

There were several replies open to our Foreign Office, backed by the Air Ministry. For example, we might have offered to send an equally strong and efficient mission to the States, guaranteeing to train the U.S. Naval Air Service to the same state of efficiency as the Japanese. And we might have guaranteed to sell to the U.S. Navy an aeroplane or flying boat, as the case might be, just as good and just as often as every one that we sold to Japan.

Also we might have said—in polite diplomatic language, of course—"All right! You fetch your gunmen and Irish Republican organisers out of Ireland, and we won't send our Naval aviators to Japan. Is that a bet?"

A Chance for Enterprise.

Howbeit, whatever may be the innermost history of the affair, it is a fact that there will be no R.A.F. Mission to Japan. Therefore it seems that here also is a chance for the merchant venturer again.

It is known that several British firms have quite respectable Japanese orders in hand for modern aeroplanes and seaplanes, for apparently the Japanese, being very acute, want something new, as well as obsolescent war machines. That being so it looks rather as if some enterprising firm might arrange a complete *un*official mission for the Japanese Navy. There are plenty of very experienced Naval aviators and mechanics and stores officers out of work who would be glad of a job in Japan for four or five years, while Commercial Aviation is developing.

One knows nothing of any such arrangement. Possibly something of the kind may be actually in process of organisation. If so, one wishes it luck, for there are great opportunities for commercial flying in the Far East, and this is the best way for British firms to gain a firm footing there. The United States have, in fact, nothing to fear from Japan, though quite possibly it may be necessary some day for America to teach Japan her proper place in the scheme of things. And so we in this country can safely do good to our own Aircraft Industry without in any way doing an injury to our American friends.

C. G. G.

A GRIEVOUS ERROR.

On Dec. 6th a short article from that paper's Paris correspondent appeared in the *Daily Mail* which, boiled down to the impression conveyed by reading it, intimated to all and sundry that Aircraft Transport and Travel, Ltd., has gone bankrupt and ceased to exist; that the Instone Air Line has laid its machines up for the winter; and that the Handley Page people, instead of running a daily service, are putting an odd machine or so across the Channel whenever there happens to be enough freight or passengers to make it worth while. The paragraph is headed, "Uncommercial Flying" and, so far as the general public is concerned, is probably the most damaging thing that has been published concerning civil aviation since civil aviation became legal.

Happily it comes at a moment when every form of business is at the lowest possible ebb and therefore cannot do as much damage to commercial aviation as it might have done if other businesses were booming and there were any possibility of getting money for commercial aviation ventures. As it is, there is no hope of getting any money for aviation for some little time, and by the time money is available this singularly inaccurate article will probably have been forgotten.

The truth of the matter seems to be that a manager was appointed for A.T and T., Ltd., not to close the business down, but in order that the A.T. and T. services may be kept running as long as possible. It is rumoured that at least three different groups of people, each of some considerable financial importance, are investigating the possibilities of this air line with a view to taking it over as a going concern, with, one hopes, Mr Frank Searle in charge.

The "Receiver" was appointed to the Aircraft Mfg. Co., Ltd., which is quite another matter.

As regards the Instone Company, it is not the firm's intention to run a regular service to Paris during the winter, but the Instone machines will be available for special journeys when desired. It is probable that quite a great deal of flying will be done by the Instone machines in England during the winter, chiefly for propagandist purposes.

Finally, the statement that the Handley Page people are not running a daily service is absolutely untrue. Handley Page Transport, Ltd., work in conjunction with the French Bréguet Company, and as a result the Handley Page machines run between Cricklewood and Paris on certain days of the week, and on the other days of the week the Bréguet Company's run between Croydon and Paris, so that there is at least one machine each way per day in conjunction with Handley Page Transport, Ltd.

One suggests that in view of the *Daily Mail's* reiterated claims to have done so much for the development of aviation, that paper might at least have endeavoured to be strictly accurate in its statements concerning aviation, and might have endeavoured to assist commercial aviation at this critical period instead of damaging it from mere lack of taking the trouble to verify its statements.—C. G. G.

MORE POSTAL FOOLISHNESS.

If an individual desires to telephone to anybody at the Croydon Aerodrome he or she is advised not to look in the telephone book for the telephone number.

The only numbers which appear in the book under the heading of Croydon Aerodrome are "Waddon, Surrey 999" and "595." Number 595 is a telephone box built into the fence by the "Arrivals and Departures" Board. There is never anybody near it to hear the bell ring, as it is some distance away from any office. Consequently that instrument is only of use for outgoing messages from Croydon. Number 999 is the private telephone of the hotel belonging to Trust Houses, Ltd., and, though the management there is always anxious and willing to help anybody concerned with the aerodrome, the staff cannot be sent running about the neighbourhood searching for individuals in their offices.

The real telephone number of the Croydon Aerodrome is Purley 1180, and from that number one can be put in direct communication with the telephones of the various air lines in their own offices, by way of the branch exchange. The beauty of the Post Office system is that this very important telephone line does appear in the Telephone Directory, but alongside the title "Air Ministry, Aerodromes, Beddington."

This aerodrome is known variously as Croydon, Waddon, Wallington, Purley, and London Terminal, but Beddington seems to be peculiar to the Telephone Directory.

AS LIGHT AS A FAIREY.

Ever since the mind of man attempted poetic imagery the phrase "as light as a fairy" has been the recognised synonym for extreme mobility, quickness in manœuvre, and elegance combined with charm.

Ariel, who promised to "put a girdle round the earth in forty minutes," was a fairy who combined lightness with speed, and may be regarded as the precursor of modern aerial accomplishments

THE MODERN EQUIVALENT.

To-day, the modern equivalent to "as light as a fairy"—at any rate among British Service aviators—is "as light as a Fairey."

Seaplanes have generally been regarded as heavy clumsy aircraft, worthy only of the ham-fisted pilot who could not be trusted to fly fast scouts over land. Though, be it noted, many of our best pilots have had to fly heavy clumsy seaplanes because they happened by force of circumstances to become Naval aviators.

But, the advent of the Fairey Seaplanes entirely changed the views of sea-going pilots. And the Fairey Seaplane of to-day is as light on its controls, as quick to manœuvre, and as handy in the air as any land-going aeroplane of similar speed and fighting power, and more so than most.

EXPERIENCE AND ABILITY.

It is easy to understand the reason why. The Fairey Seaplane is the outcome of experience and ability. Its designer, Mr. C. R. Fairey, was experimenting with the stability and controllability of aeroplanes in the days when most people regarded the box-kite biplane as the last word in aeroplane design. His experience in designing and building inherently stable aeroplanes pointed out the way to combining stability with controllability. As the result the Fairey Seaplane is stable when left to itself and wonderfully controllable when required to be so.

In designing the modern seaplane Mr. Fairey has had the invaluable help of the war experience of a number of the most skilful and most intelligent pilots of the Royal Naval Air Service and the Royal Air Force. Their experience of what seaplanes have been and of what they ought not to be, combined with their ability to explain what has been wrong with seaplanes in the past and to suggest what was wanted to make them perfect flying machines, have together made the Fairey Seaplane of to-day pre-eminently the finest seaplane in the world.

VARIABLE LIFT AND STABILITY.

Among the details which have given the Fairey Seaplane its lead over all others is the variable camber gear which enables the pilot to increase the lift of his wings for quick rising or slow alighting, while at the same time retaining the full efficiency of his ailerons for lateral control.

Another gear operating the tail-plane enables him to vary the angle of the tail and thus to trim the machine fore-and-aft so as to make it, at will, inherently stable and capable of flying without control or unstable and absolutely controllable.

By an ingenious interlocking of the camber gear and the tail gear the latest Fairey Seaplane is automatically kept properly in trim when the wing camber is varied. Thus the control is maintained at that degree of lightness for which the Fairey Seaplanes are famous.

THIS INTERLOCKING OF VARIABLE CAMBER GEAR AND TAIL ADJUSTMENT IS EFFECTED FOR THE FIRST TIME ON THE FAIREY SEAPLANE.

SIMILAR INTER-RELATION OF LONGITUDINAL BALANCE WITH VARIABLE WINGS WILL BE NECESSARY IN ALL AEROPLANES OF THE FUTURE IN WHICH THE WING SURFACE IS VARIED EITHER AS TO CAMBER OR AREA.

ONCE MORE, THEREFORE, THE FAIREY IS DOING PIONEER WORK.

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NAVAL AND MILITARY AERONAUTICS.

GREAT BRITAIN.

NAVAL.

H.M.S. "Eagle."

At the paying-off of H.M. Aircraft-carrier *Eagle*, from the balance of the canteen funds £10 was sent to St. Dunstan's Hostel and the remainder, amounting to £59 16s 10d., was sent to the United Services' Orphans' Home for Girls.

MILITARY.

EXTRACTED FROM WAR OFFICE COMMUNIQUES.

Nov. 8th.—Middle Euphrates.—Our aeroplanes have continued active against hostile gatherings south-east of Kufa. One pilot has been wounded.

Nov. 10th.—Lower Euphrates.—A column from Samawa, carrying out punitive operations on both banks of the Euphrates around Khidr, met with stubborn resistance on the 6th. . . . Our infantry, assisted by aeroplanes, forced the Arabs from their positions. . .

Middle Euphrates.—Aerial operations have been successfully continued in the area north-east of Kufa and north-east and north of Diwanie.

Nov. 12th.—Lower Euphrates.—A column from Samawa, assisted by aeroplanes, has carried out punitive measures north of Khidr (south-east of Samawa).

Nov. 19th.—Lower Euphrates.—On the 15th the 34th Brigade Column, assisted by aeroplanes, carried out punitive operations from Imam Abdulla (four miles N.N.W. of Samawa) for five miles to the east.

Middle Euphrates.—An insurgent camp on the right bank of the Euphrates, 15 miles north-north-west of Musaiyib, was attacked by our aeroplanes on the same date (the 15th).

Dec. 1st.—Our aeroplanes on Nov. 26th attacked an insurgents' camp eight miles north of Nasiriyeh.

SUMMARIES OF EVENTS.

MESOPOTAMIA.

The following is extracted from a précis of a report on the tribal situation from the General Officer Commanding, Mesopotamia, which was issued by the War Office on Oct. 7th :—

Lower Euphrates.—In the Suk-Esh-Shuyuk area, the marsh Arabs started to build a dam across one of the Euphrates channels between that place and Hammar Lake, to obstruct navigation, but work has been stopped by an air demonstration over the area.

In the Samawa area, one or our bombing raids set fire to Samawa town and caused a large exodus of hostile tribesmen

The following is extracted from a summary of events in Mesopotamia between Oct. 18th and Nov. 18th, issued by the War Office on Nov. 22nd :—

The 53rd and 55th Brigade columns have carried out a series of punitive operations between Hillah and Tuwairij, north-west of Hillah towards Museyib, along the Hillah-Kifl-Kufah road and railway, and finally in the area of south-east of Hillah along the Euphrates towards Jerbuiyah.

Our aeroplanes have been active in support of these operations, and have also extended their incursions farther to the south against the still hostile tribes of the Shamiyeh division. So effective has been their action that many of these tribes have expressed their desire to surrender, and this defection, if it should in fact come about, will go far in disheartening the remaining recalcitrants and in facilitating our speedy re-occupation of their territory.

ARABIA.

The following is extracted from a report of the General Officer Commanding the Egyptian Expeditionary Force in the neighbourhood of Beisan and Semakh. The report was issued by the War Office on Nov. 8th, in accordance with Army Order 404 of 1920.

Early on the morning of the 24th two troops (of Central Indian Horse) which were sent to collect the Arabs killed on the previous evening (in the neighbourhood of Semakh) were hotly engaged with the enemy, who were endeavouring to outflank them. . . . .

An aeroplane appeared and machine-gunned the enemy, but the pilot was wounded and forced to land near the C.I.H. camp. Four other aeroplanes bombed the enemy's position with great effect; and by two o'clock the enemy had completely withdrawn east. . . .

The work of the R.A.F. was invaluable, and was largely responsible for the withdrawal of the enemy.

The North-West Frontier.

The following is extracted from an official statement issued by the Viceroy of India :—As a result of aerial operations on Nov. 15th and 21st the Hassan Zai and Tilli Sayyida tribes of the Black Mountains have handed in the balance of rifles.

AIR FORCE.

A Flying Accident in Egypt.

The following was issued by the Air Ministry on Dec. 1st :

The Air Ministry regrets to announce that an aeroplane on duty in Egypt met with an accident on Nov. 29th, which resulted in the deaths of Flying Officer C O. Rigden and of 295261 Aircraftsman A. L. Goodill.

Flying Officer S. T B. Cripps was seriously injured.

The next of kin have been informed.

The cause of the accident is at present unknown.

[An unofficial account of this accident stated that the aeroplane was employed in local mail-carrying duties.]

The War in Ireland.

The following is extracted from the official list of the casualties of the Macroom ambush :—

KILLED.—Capt. W. Pallester (late R.A.F.), care of Mrs. Brooke, 71, Primrose Avenue, Shire Green, Sheffield.

Cadet W. T. Barnes, D.F.C. (late R.A.F.), 47, Glebe Road, Sutton, Surrey.

Cadet J. C. Gleare (late R.A.F.), Crowdale, Canterbury.

Cadet F. Taylor (late R.A.F.), 21, Seaview Road, Gillingham, Kent.

Temp. Cadet C. D W. Bayley (late R.A.F.), 24, Reynard Road, Chorlton-cum-Hardy, Manchester.

WOUNDED.—Cadet H. F. Forde, M.C. (late R.A.F.), Zephyr Lodge, Bexhill-on-Sea.

MISSING.—Cadet C. J. Guthrie (late R.A.F.), Coombes, Buckfastleigh, Devon.

A Repatriated Prisoner.

Among the sixty-two repatriated British subjects who have reached Finland from Russia is Captain Neville, R.A.F.

R.A.F. Rugby.

On Dec. 1st the H.A.C. beat the R.A.F. Rugby Team by 42 points to 0.

R.A.F. Fencing.

A return fencing match between the R.A.F. and Grave's School of Arms held recently resulted in a draw. It has been decided to hold a further match to decide the question of superiority.

A Calshot Dinner.

Some of the airmen who were stationed at Calshot Seaplane Base are desirous of meeting others who were there with a view to a reunion. They are asked to communicate with Mr. A. J. Spinks, 72, Greenfield Street, South Tottenham, N.15.

A Memento of an Occasion.

The one great flaw in the organisation of the R.A.F. Tournament at Hendon last summer was the scarcity of programmes. Nobody could be blamed for it, for who was to imagine that 60,000 people at least would arrive when 10,000 had been expected? In any case, thousands who were at the Tournament never managed to secure a programme at all and many wished that they had been able to do so.

Now one learns that a few dozen of these precious documents had been stowed away by some earnest official and as a result their existence has only recently been discovered. The Committee has decided to sell this small number of programmes for the benefit of the R.A.F. Fund at 1s. each, plus 2d. for postage. Anybody who would like to have a copy (so far as the supply goes) can obtain it by writing to Flight Lieut. W. H. Longton, D.F.C., A.F.C., R.A.F. Depot, Uxbridge. It is advisable to apply early as the number available is very small.

CANADA.

The Canadian Air Force Regulations were passed by Council early in September, and the Air Force is beginning to assume some shape A School of Special Flying is to be opened at Borden with Gosport-trained officers in charge. Lieut.-Col. Redpath is now in England studying R.A.F. methods of training.

INDIA.

A Gift.

The Government of India has received a hundred aeroplanes as a gift from the British Government. Twenty of these machines will be placed at the service of the Royal Air Force in India and the remainder will be divided between local Governments, ruling Princes, aero clubs and companies prepared to establish aviation schools. R.A.F. officers resident in India are eligible for these machines

The aeroplanes will be handed over at Karachi free of charge. A condition of ownership is that they shall be used for instructional or demonstration purposes, and not sold to a third party.

FRANCE.

Trick Flying Condemned.

On Nov. 19th the French Army aviator René Destienne was condemned by a Military Court to one year's imprisonment on a charge of culpable homicide, and breaking Army Regulations on Sept. 6th by flying low over Montrouge and eventually falling in a playground where a number of children were playing, four of whom were killed and some injured.

The Wazzan Campaign.

The French Protectorate troops under General Poeymirau brought the Wazzan campaign to a successful conclusion last October. It is announced that aeroplanes took part in the operations.

JAPAN.

A correspondent of THE AEROPLANE in Japan writes :—

Flight Across the Japanese Alps.

The first flight across the Japanese Alps attempted by the Japanese Army airmen on Sept. 27th, was a success. Two Sopwith biplanes and two Maurice Farman biplanes participated, and all machines safely reached the Kanazawa Military Ground on the noon of the same day.

Major Iba Killed in Burning Aeroplane.

Major Iba, one of the most famous and skilful military aviators in Japan, and his mechanic, Mr. Izawa, were killed on the morning of Oct. 4th at Tokorozawa Army Aerodrome.

His Nakajima biplane burst into flames about 300 ft. above the ground, as he was making efforts to land The flames, however, as soon as they reached the gasoline tank of his machine, exploded it with a terrific report, both men losing their lives.—N. K.

RUSSIA.

BOLSHEVIK COMMUNIQUE.

Nov. 23rd.—In the Volotchissk direction our troops have made a decisive attack. . . . . Further to the south we captured an enemy aeroplane.

NAPIER

The *Proved* Best

THE 450 H.P. Napier was the only engine to gain for aircraft the highest prize in each of the **British Air Ministry 1920 Competitions,** superseding all other aero engines.

These machines also received **Highest Marks** for **Reliability. Speed** and **Economy.**

The knowledge behind the construction of the wonderful Napier aero engine—the same principles in design, as well as the same high standard of workmanship and materials—is employed in the manufacture of the

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It is up-to-date in every detail. Gives the greatest efficiency. Has wonderful acceleration. Is fast on hills and economical to run. Exceedingly comfortable, whilst its distinctive appearance places the Napier at the top.

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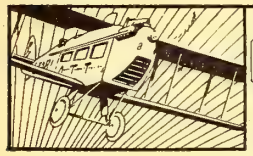
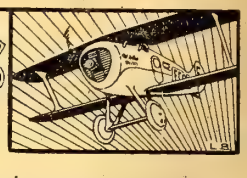


COMMERCIAL AERONAUTICS
AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

NOVEMBER 29th:

A.T.T., DH18, G-EAUF, London-Paris, 12.34-15.15, G.&M., 6, Armstrong.
M.A., Breguet, F-CMAI, London-Paris, 12.50-15.45, G., Nil, Martel.
M.A., Breguet, F-CMAC, London-Paris, 12.50-15.40, G., Nil, Le Sec.
H.P.T., DH9, G-EATA, London-Brussels, 13.15-15.25, G.&M., Nil, Jones.
A.T.T., DH18, G-EARO, Paris-London, —11.42, Nil, Nil, Holmes.
G.E.A., "Goliath," F-GEAD, Paris-London, 12.35-15.06, G., 2, Labouchere & 1
A.T.T., DH16, G-EAPM, Paris-London, 12.49-14.50, G., 2, Forson.

NOVEMBER 30th:

G.E.A., "Goliath," F-HMFU, London-Paris, 11.50-16.20, G., Nil, Favreau & 1.
A.T.T., DH16, G-EASW, London-Paris, 12.40-15.35, G.&M., 2, Lines.
H.P.T., HP, G-EAMA, London-Paris, 13.01—, G., 4, McIntosh.
M.A., Breguet, F-CMAB, Paris-London, 12.15-14.30, M., 3, Le Men.
A.T.T., DH18, G-EAUF, Paris-London, 12.40-14.55, G., 6, Armstrong

DECEMBER 1st:

A.T.T., DH18, G-EARO, London-St. Inglevert, 09.10-10.10, Nil, 3, Holmes.
G.E.A., "Goliath," F-GEAD, London-Paris, 11.51-14.30, G., 1, Labouchere.
A.T.T., DH18, G-EAUF, London-Paris, 12.40-15.10, G.&M., Nil, Forson.
M.A., Breguet, F-CMAB, London-Paris, 12.45-15.20, G., Nil, Le Men.
A.T.T., DH9, G-EAPL, London-Rotterdam, 13.15—, G., 1, Carter.
M.A., Breguet, F-CMAC, Paris-London, —11.35, G., Nil, Challoux.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.40-15.45, G., 3, Favreau & 1
A.T.T., DH16, G-EASW, Paris-London, 12.50-15.20, Nil, 4, Lines.
M.A., Spad, F-CMAY, Paris-London, 13.05-15.29, G.&M., Nil, Le Sec.

DECEMBER 2n

NIL.

DECEMBER 3rd:

NIL.

DECEMBER 4th:

A.T.T., DH16, G-EAPM, London-Paris, 12.33-14.20, G.&M., Nil, Milnes.
A.T.T., DH16, G-EALU, London-Paris, 12.39-14.25, Nil, 3, Reeves.
A.T.T., DH18, G-EAUF, Paris-London, 12.40-12.50/5th, G., 4, Forson.

DECEMBER 5th:

M.A., Breguet, F-CMAC, London-Paris, 12.24-15.10, Nil, Nil, Challoux.
G.E.A., "Goliath," F-GEAC, London-Paris, 12.00—, G., Nil, Favreau & 1
M.A., Breguet, F-CMAJ, Paris-London, 09.40-12.50, G., Nil, Martel.
A.T.T., DH16, G-EAPM, Paris-London, 12.20-15.45, G., 3, Milnes.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

NOVEMBER 29th:

H.P.T., DH9, G-EAUN, Paris-London, 13.30-15.25, G.&M., 1, McIntosh.

NOVEMBER 30th:

H.P.T., DH9, G-EATA, Brussels-London, 12.10-14.50, G.&M., 1, Jones.

DECEMBER 1st:

H.P.T., DH4a, G-EAVL, London-Brussels, 13.50, landed St. Inglevert 14.55 (Paris 13.20 2/12/20), G.&M., Nil, Helliwell.

DECEMBER 2nd:

NIL.

DECEMBER 3rd:

NIL.

DECEMBER 4th:

H.P.T., DH4a, G-EAVL, Brussels-London, 14.10 (2/12/20) 11.50, G.&M., Nil, Helliwell.
H.P.T., DH4a, G-EAVL, London-Paris, 13.17-15.05, G., 2, Fowler.
H.P.T., DH9, Paris-London, 13.00 (Landed at Lympne 16.12), Nil, 2, McIntosh.

DECEMBER 5th:

H.P.T., HP, G-EASY, London-Paris, 12.03-15.35, G., 3, Jones & 1.
H.P.T., DH9, G-EATA, London-Brussels, 12.17, landed at Lympne, G., Nil, Hope.
H.P.T., DH4a, G-EAVL, Paris-London, 11.48-16.07, Nil, 2, Fowler.

Air Port Statistics.

Owing to bad weather, mists and gales prevailing during the past week, the air lines to the Continent have been badly hampered, but not to so great an extent as the sea transport services.

CONTINENTAL

MACHINES:	Croydon	30	Cricklewood	9	Total 9
PERSONNEL.—Passengers:	Croydon	47	Cricklewood	11	Total 58
Crews:	Croydon	35	Cricklewood	10	Total 45
					Grand Total 103

Inland Flying at Croydon.

Nov. 29th.—A. V. Roe & Co., "Baby," Hamble to Ipswich (Hinkler); M.W.T.C., DH6, 2 tests (Lovell).
Nov. 30th.—M.W.T.C., DH6, 1 test (Lovell); R.A.F., Isle of Grain to Farnboro.
Dec. 1st.—L.A.S., Avro from Leatherhead return (Muir); 1 joy-ride, 1 test; M.W.T.C., DH6, 1 test (Lovell).
Dec. 2nd-4th.—Nil.
Dec. 5th.—I.A.L., "Bat," 1 joy-ride (Barnard); L.A.S., Avro, 3 joy-rides (Muir); DH16, 11 joy-rides (Muir); A. V. Roe & Co., "Baby," to Southampton from Cricklewood (Hinkler).

Inland Flying at Cricklewood.

Nov. 29th.—H.P.T., DH9 (Fowler), DH4a (Foot), from Croydon.
Nov. 30th.—Nil.
Dec. 1st.—H.P.T., 2 DH9s (Helliwell), 1 DH9 (Brackley) tests; S.N.E.T.A., DH4 (Hope) test.
Dec. 2nd.—H.P.T., O/400 (Hope) started Paris, returned owing to weather; A. V. Roe & Co., Avro "Baby" (Hinkler) from Hamble.
Dec. 3rd-4th.—Nil.
Dec. 5th.—A. V. Roe & Co., Avro "Baby" (Hinkler) to Croydon; H.P.T., BE2e (Curtiss) test.

The London Terminal Aerodrome.

Mr. and Mrs. Hinkler came up from Hamble on Monday on the two-seater Baby Avro and went on to Ipswich, returning to Cricklewood on Thursday and going over to Croydon on Sunday, where Mr Hinkler took up several passengers before returning to Hamble just before dark.

Although Airco (the Aircraft Manufacturing Company) have gone into liquidation, it seems that A. T. and T. will still carry on. They are controlled by the B.S.A.-Daimler combine. Although the winter is bound to be very trying, it is to be hoped most sincerely that this, the premier British Air Line, who run the fastest commercial machine in the world, will survive the winter and establish for themselves that position which, by their businesslike methods and hard, solid work, they so richly deserve.

On Wednesday of last week Mr. Muir came over on an L.A.S. Avro and executed some nice, clean loops and spins. He was over on Sunday with the D.H.6 and the Avro carrying joy-riders.

Mr. Barnard, on the Instone "Bat," was out on Sunday morning. The "Vimy" has not yet returned from Brooklands but was expected early this Wednesday morning.—G. D.

The Air Port of Cricklewood.

Owing to climatic conditions the London-Amsterdam service has been suspended, but passengers for Amsterdam who leave Cricklewood at 12.30 reach Brussels in time to catch a connection which enables them to make Rotterdam and Amsterdam the same evening.

The STORY of SHELL SERVICE II.

Reproduced from E McKnight Kauffer's famous hoarding at Shell Corner, Kingsway, London.

SHELL Service to the motorist begins with the arduous and oft-times hazardous work of prospecting for oil and sinking test wells in remote parts of the world, an undertaking always highly costly yet sometimes entirely unproductive. When eventually oil is struck, it is transported by pipe-lines to the refineries, located perhaps hundreds of miles distant.

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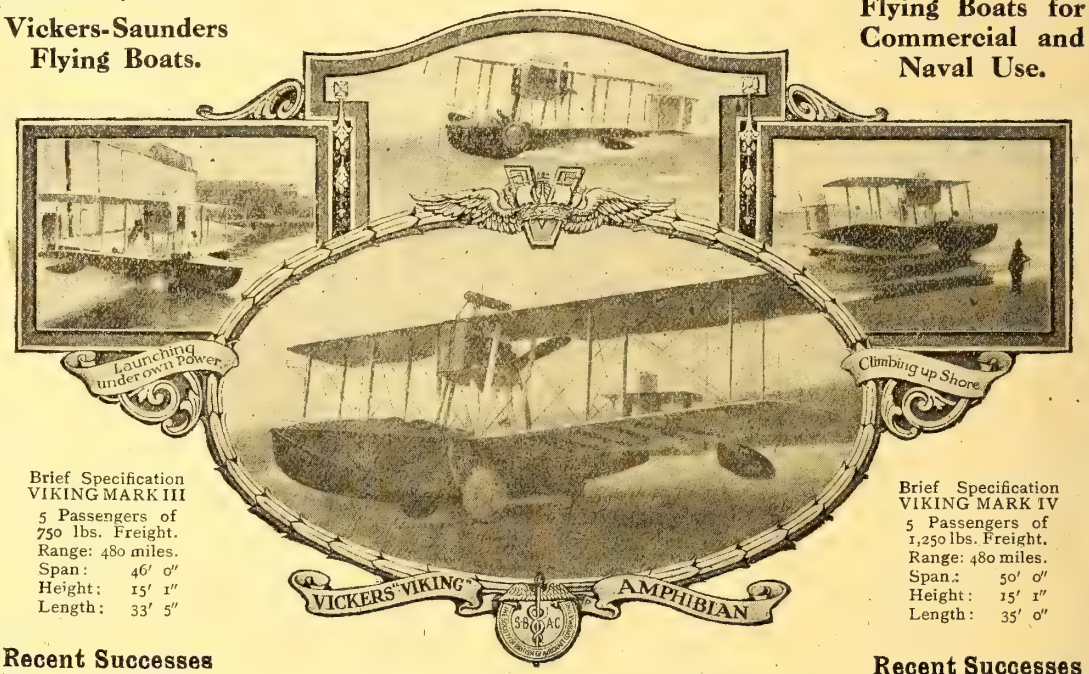

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Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Brief Specification
VIKING MARK IV
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Range: 480 miles.
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Height: 15′ 1″
Length: 35′ 0″

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The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

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2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

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GLASGOW—Vickers House, 247, West George Street.
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Recent Successes

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION, September, 1920.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

The correspondence relating to the steam turbine controversy is continued below. Col. Bristow, in response to the invitation of Messrs. Richards and Butler, expresses a hopeful view as to the probable reliability of the turbine —but not any great hopes of its commercial utility.

Messrs. Richards and Butler return to the defence of the turbine, and Capt. Sayers replies. Interesting as is the subject, it is feared that space cannot be spared for any further lengthy argument on the subject.

Two very important papers read before the Royal Aeronautical Society bearing on the practical operations of airships are reported in abstract in this issue. That by Squadron Leader Scott on "Piloting" is probably the first case in which an experienced airship pilot has given his views as to the possibilities of the airship as a vehicle.

The paper by Flight Lieut. Butcher on mooring airships is also of the highest importance.

At the late Air Conference Mr. Calthrop, of "Guardian Angel" parachute fame, made a strong plea for the compulsory fitting of parachutes to civilian aircraft. His speech was scarcely heard owing to the noise of those departing for a free ride to a free lunch at Croydon. This speech is reproduced in a slightly abbreviated form on page 886.

A note by Lieut.-Col. H. S. Holt also concerns parachutes, with particular regard to the question of the invention of the pilot parachute system.

THE STEAM TURBINE CONTROVERSY.

The following letters have been received :—

Col. Bristow's Response.

Sir,—I have read the steam-turbine correspondence, and in response to the too complimentary reference to myself beg to offer a few remarks on the subject viewed firstly from an insurance standpoint.

Pending the actual production of an aero-turbo plant, which is, of course, essential before its reliability can be ascertained, it is only possible to generally review the main mechanical features of the two types of power plant and compare the breakdown possibilities of the respective systems.

Before doing this, however, it is first necessary to envisage the type of turbine that will be necessary.

Of the Most Suitable Type of Turbine.

It is considered that the turbine with twin elements rotating in opposite directions cannot be made suitable for aircraft, although it is agreed to be a very fine type for stationary work. In the first place, uniform opposed rotation is obtained by what is in effect electrical interlocking, whereas on aircraft the speed of each element will depend upon the resistance of its own airscrew and gears, which could hardly be kept uniform, especially if the propellers were in the simplest position from the general driving standpoint—i.e., in tandem.

Regulation, therefore, would become impossible, with resultant troubles of perhaps a serious nature.

Probably a more important objection to this type is due to the fact that two gearboxes would be required, and with the same tooth and bearing loading the weight of two with shafts, casing, and supports would almost certainly be greater than one unit of double the capacity. Overall risk of breakdown would be greater and mounting difficulties would be increased.

Of Gyroscopic Effects.

Further, it is doubtful if the blade system and construction of this type would stand turning in the air.

It must be remembered that an aeroplane may turn at one radian per second, and even at a much lower turning speed distortion would almost certainly occur.

During the war the rotor of an auxiliary turbine in a battleship walked clean out of its casing when the vessel turned suddenly to avoid what looked like a mine.

A Few Practical Considerations.

Blades, shafts and bearings have therefore to be of special construction, and in addition the weight and speed of the rotor must be such as will prevent the aeroplane from becoming uncontrollable due to the gyroscopic effect.

Taking for example a 1,500-h.p. set, the propeller would be required to turn at probably 700 r.p.m.

In order to economise weight it would be necessary to use the highest possible single-stage gear reduction—say 10 : 1—although as a rule turbo-gear makers do not care to go beyond 8 : 1. This gives a turbine speed of 7,000 r.p.m., and bearing in mind everything that it must and must not do, a single wheel with several rows of blades may be found to be the best all-round compromise.

The steam consumption will not be of the best and the gears will not be an easy matter, but it will lend itself more readily to rigid construction of blading, shaft and bearings, and the awkward question of thrust and its attendant troubles will be avoided.

If the gear-reduction ratio were decreased to 8 : 1, then 5,600 r.p.m. for the rotor would add to the weight but at the same time would probably provide a better overall proposition.

Of Things Beyond the Turbine.

With regard to the boiler, condenser, pumps, etc., nobody knows what they can actually be made for in respect to the weight-reliability factor because investigation on these lines has never been necessary. We do know, however, that the weight per horse-power of the modern petrol aero-engine has been brought down to a figure that at one time seemed quite impossible, and it has probably even now not reached finality.

There does not appear to be anything inherent in the problems that would prevent weights being reduced very considerably whilst maintaining the reliability to a reasonable extent.

What is to be Gained.

At the moment, therefore, we can only consider what we should gain from a steam plant.

In the first place, there would be eliminated petrol, petrol pumps, strainers, petrol piping, cocks, non-return valves, carburettors with jets and floats and altitude adjusters, valves, valve springs and rockers, pistons, piston rings, gudgeon pins, connecting-rods, big-end bearings, long crankshafts with their attendant vibration troubles, camshaft drives, magnetos, couplings, high-tension wires and sparking plugs.

The lubrication system on the steam plant should obviously be a much more simple and reliable matter than that of the petrol engine, and this alone is a most important item.

With regard to the cooling and condenser systems, the amount of water actually circulated is far less with the steam plant than with a petrol plant. Taking for example a Napier "Lion" engine and a corresponding turbine with a steam consumption of, say, 5,400 lb. per hour, this seems a small amount to circulate compared with the 30,000 lb. of water pumped hourly through the "Lion" radiator.

Conditions in the closed aero-engine circuit are probably easier, but it would be wrong to disparage the steam plant

merely because of the weight of water to be circulated. Engine water-pipes, cylinder water-jackets, pumps, radiators, etc., cause frequent troubles, and it seems only reasonable to suppose that a condenser, pump and fittings would be no worse. Evaporative condenser manufacturers would be highly indignant if it were suggested that their overall reliability were as bad as the cooling system on an aero-engine, but at the same time they would have to admit their inability to foretell what sort of reliability they could guarantee at the lower weight and with possibly a bad general disposition of parts.

The Boiler.

From a reliability standpoint the boiler is considered by far the worst part of the risk.

To mount an oil-fired boiler giving superheated steam at possibly 200 lb. pressure and 600 deg. F. with steam pipe seems to be a big task for an aeroplane designer. It may, of course, be possible to dispense altogether with the steam pipe, but even then the other items would still constitute a difficulty that is absent from the present power plant.

The turbine gearbox compared with the aero-engine gearbox is relatively a much better engineering job, and after a little experience of this particular class of duty should prove as reliable as the best aero-engine gear of to-day. As is well known, aero-engine gears have been productive of considerable trouble in the past, although the Napier "Lion" must be specifically exempted from this generalisation.

The Reliability of the Steam Plant.

Apart from the boiler question, therefore, it would seem reasonable to expect a very much higher reliability factor with steam plant than with a petrol engine, but it is not, of course, to be expected that the full reliability is going to be attained in the first few years' working.

Capt. Sayers rightly says that the central station engineer would be horrified at the idea of running his station with turbo-plant designed for special aeronautical purposes, but he would be far more shocked if it were suggested that he should run the station with anything similar to petrol aero-engines.

A Conclusion.

In my opinion an aeroplane could be flown to-day with a steam prime mover, and it could be made a reliable unit, more so than the petrol engine.

It would have a longer life, be easier to maintain in service, and certainly in the long run cost less.

I do not believe that it can be used yet for the simple reason that the ratio of propeller thrust to unit weight of fuel carried is so low as to render the system impossible of utilisation on any machine that has to operate as a transport vehicle for a commercial undertaking.

With apologies for the length of this letter,

(Signed) W. A. Bristow,
Lieut.-Col., M.I.E.E., M.I.A.E., F.R.Ae.S.

Messrs. Richards and Butler Return to the Attack.

Sir,—We are very much gratified that our letter to you of Nov. 10th has, in response to our invitation to criticise our proposals, drawn from Capt. Sayers such a lengthy and deeply considered reply, and we hope that other interested readers will enter the arena to join in what gives every promise of being an interesting discussion.

We are sorry that he thinks we took strong exception to his article. This is not so, and we hold no brief for the "strafing" of the petrol engine; in fact, commercial aircraft will have to make a living out of it as it stands for some time yet. It is the aero industry's best product to date and, like Touchstone of Audrey, the industry can say: "'Tis a poor thing, but mine own." Nevertheless, there is no reason why we should be prepared to support this bucolic maiden indefinitely.

Whilst it is quite true that the figures quoted by us were estimates and hopes, we contend, save only on the condenser problem (expressly stated in our letter as the crux of the question), that the proposition is one which cannot be turned down on other scores. We quite admit the soft impeachment of Capt. Sayers of a belief in the future of steam plant as an aeronautical prime mover, subject always to the solution of the difficulties set forth in our letter, and we hope to show that we are no by means crushed—let alone demolished—by the arguments adduced in his forcible reply.

In the rôle of Joshua he has but loosened a few coping stones of our walls, which we now endeavour to cement up again.

An Explanation.

Before proceeding to comment further, perhaps it will be as well to refer to the Editorial remark on p. 818 that the figures for the weight at the beginning and end of flight were not in agreement with the tabulated statement. This obviously refers to the petrol plant weights, but it must be remembered that the I.C. engine power is only 1,005 h.p. at the height quoted (compared with 1,500 at ground level) this making the comparison accurate.

Tabulated Claims.

Capt. Sayers concedes that we have made good use of the fact that the turbine plant does not lose in power with increase of altitude, but we cannot agree that this is the sole point in favour of turbines. Does he not consider the following advantages—which we expressly stated that we did not labour as being obvious—to be very strong arguments in its favour? We refer to—

(a) Practical elimination of fire risk;
(b) Elimination of petrol system, with all its faults of carburation, air locks, punctured floats, choked jets, etc.;
(c) Elimination of electrical ignition, oily plugs, carbonisation and pre-ignition;
(d) Elimination of inlet and exhaust valves, with burning and distortion troubles;
(e) Absolute uniformity of turning moment, with abolition of propeller flutter;
(f) Elimination of vibration and reduction of noise;
(g) Elimination of smell;
(h) Vastly improved flexibility;
(j) Ability to operate on a fuel which is relatively cheap.

There are other minor points, but it is considered that the above list is sufficiently imposing to warrant a close investigation as to whether the demerits of the plant are of sufficient importance to outweigh the above considerations, coupled with the gist of our letter *re* depreciation, insurance and running costs.

The Power of the Napier Engine.

The power of petrol plant we have based on the maker's figures of 375 at cruising speed at 2,000 r.p.m. at ground level. Also the makers' figures give 465 permissible for three minutes, which gives 1,860 h.p., not 2,000 as stated by Captain Sayers. We particularly considered cruising speeds only to make the comparison fair, as the turbine proposed is capable, as installed commercially, of 25 per cent. overload, which would give us 1,875 b.h.p. for short periods, so that the conditions are equal. The over-running of petrol engines (usually against the makers' wishes) is notoriously detrimental to their longevity.

In Defence of Assumptions.

We have certainly assumed that the steam plant can be installed on bearers and supports of the same weight as for the petrol plant, this being due to the fact that the outfit consists of dead load or of parts rotating with absolute uniformity.

The turbine and gearing lends itself admirably to installation in the nose of the fuselage, eliminating at one stroke the outboard nacelles, bearers, etc., necessary for the support of four vibrating petrol engines.

With regard to the statement that we have assumed that the plant can be installed in a space equal to that of the petrol plant, we have taken identical machines in both cases.

In fact, drawings showing a steam plant as outlined installed in a V.1500 Handley Page bomber have been in existence for some eighteen months. Moreover, the plant has the additional advantage that the single unit power plant is accessible at all times instead of being located exterior to the fuselage, where attention during flight is, if possible, at least very inefficient and dangerous. We suggest that Captain Sayers should make a voyage of inspection of some modern power stations having small units of the size and type proposed by us and obtain ocular demonstrations that the bulk of the steam turbines in question is quite within the imposed limits. We shall be happy to furnish names of such places if he so desires.

We are quite in agreement with Captain Sayers that the stumbling block is the condenser, and we insisted strongly upon this in our original communication, and it is upon this particular item that research should be concentrated.

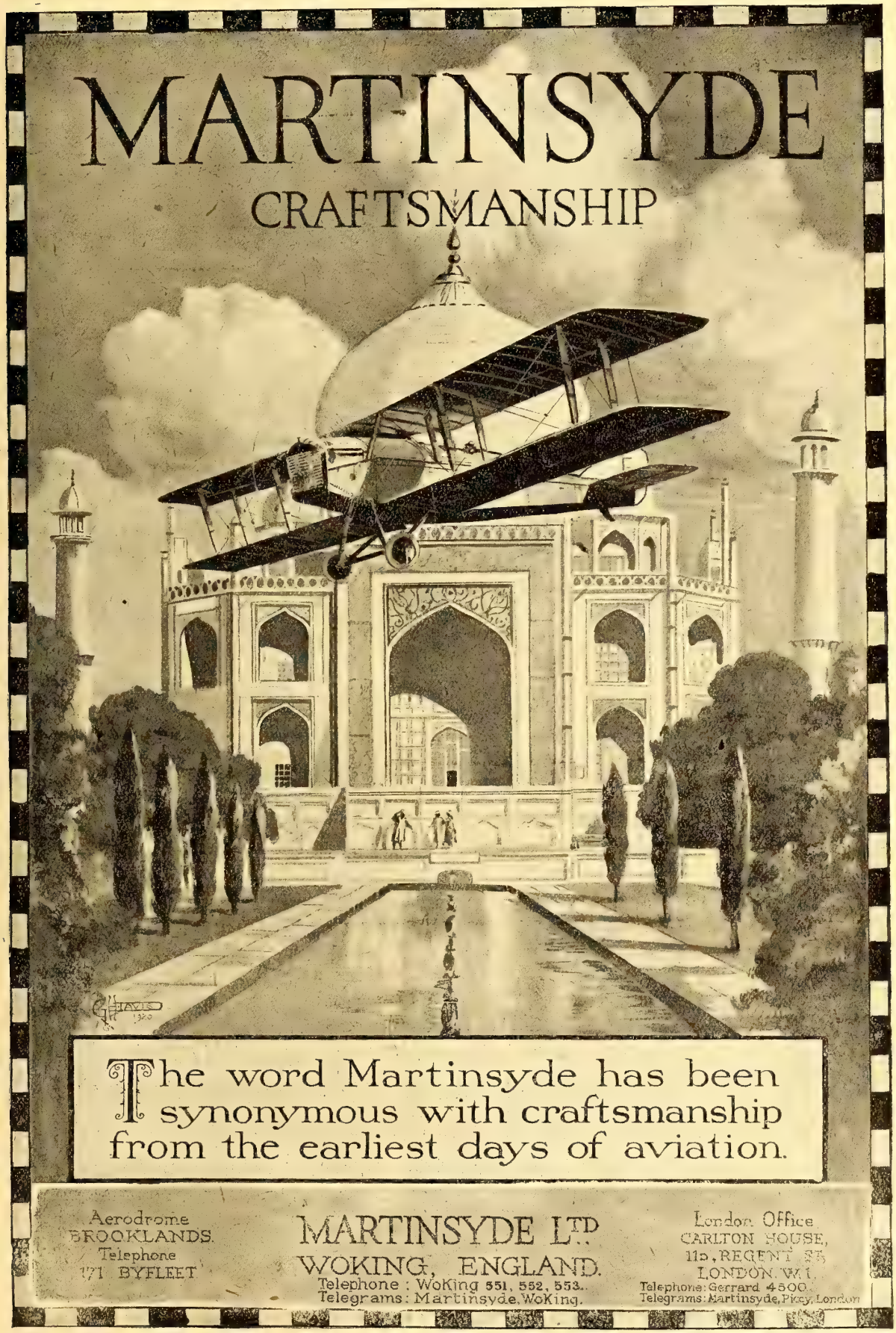
Concerning Space.

Whilst we concur that the saving in space and cost of land occupied is of great importance in central station work, yet this very point has been taken into consideration in most plants and the issue is only confused by the introduction of such a parallel—Captain Sayers in his original communication being himself the culprit.

The layout of almost any power station will show large unoccupied spaces for future extension, the head room of buildings being more concerned with crane arrangements and fuel supply.

Concerning Reliability.

With regard to reliability, Captain Sayers concurs in our contention that the turbine is almost entirely free from breakdowns, and further on states that the mechanical structure of an aero engine has a *fair* degree of reliability, but that the essential accessories are the chief cause of failure owing to the drastic pruning they have been submitted to. It is a feature of our case that the bulk of these unreliable acces-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sories have been eliminated, the remainder being only subject to known steam problems with consequent gain in reliability of the plant as a whole, compared with the petrol engine troubles detailed in points (a) to (j) above. It matters little what fails if it brings the machine down, and reduction in the number of potential causes of failure is surely an aim to be striven after.

We quite concur that a power station engineer would not be enthusiastic about the steam plant proposed, but we imagine he would infinitely rather have it than the present-day aeroplane plant operating under similar conditions. In both cases duplication is cut down to a minimum, and, as pointed out above, the comparison is scarcely justifiable in that no development work in lightening the steam plant with a view to its adaptation for aircraft work has been undertaken.

We agree that loss of vacuum will reduce turbine output, that a split tube will deplete the stock of water, but are the faults detailed above as inherent in the petrol plant not even more serious? Admitting all these things, we submit that Captain Sayers has not adduced a convincing argument to the penultimate paragraph of our letter pointing out that the petrol plant has had the advantage of years of development, whereas work on the steam plant, with the exception of that of a few enthusiasts, has been nil. It is, consequently, not to be expected that perfection could be attained at the first onset, and our argument that progress could only be with vigorous experimental work still holds good.

We regret that Captain Sayers thinks we have adopted the dodge of divorcing a phrase from its context, and must admit that we fail to discover upon what portions of the article he holds us guilty.

We regret also that to many of our points Captain Sayers has made no reply, so that following the ancient saw we presume that "silence gives assent."

Apologising for the inordinate length of this reply,

We are, yours faithfully,

Geo. Tilghman Richards,
F.R.Ae.S., M.I.M.E., M.I.Ae.E. (Hns.).
R. J. Butler, M.I.N.A.

The Defence of the Internal Combustion Engine.

The communication from Messrs. Richards and Butler can not be regarded as adding to the strength of the steam turbine case. It contains no answer to the questions raised as to why it should be assumed that the complex and essential adjuncts to an effective steam turbine plant should be more reliable than the relative simple auxiliaries of the petrol engine when the former have been as drastically pruned in weight and in space occupied as have the latter. There is in it very little of fact. Some of what purports to be fact is open to serious question.

A Reiterated Error.

An error in the computation of the power developed by the Napier "Lion" engine was pointed out in the previous reply to the same authors. The error is here reiterated with circumstance. It is stated that the makers give 375 h.p. at 2,000 r.p.m. at ground level as the cruising power, and 465 as the maximum permissible power for 3 mins. Possibly Messrs. Napier, replying to a Scotch enquiry, allowed for Scotch petrol suffering the same dilution as has befallen other Scotch spirits. Even so, and allowing for Lord Weir's prophecy of a number of dry Scotch summers, who will want to fly to Scotland?

In England to-day (Nov. 30th) the makers give the figures as 484 h.p. at 2,100 r.p.m. maximum output, 470 h.p. at 2,000 r.p.m. normal continuous full power, and state that in practice this type of engine has flown for hours at 2,200 r.p.m., giving at least 490 h.p.

Referring to the power plant weights which were questioned on page 818, the authors give 1,005 as the h.p. of four such engines at 1,000 ft., which is 251.25 h.p. each. This figure is arrived at by taking their own figure of 375 h.p. as a full throttle figure, and assuming that the decreased m.e.p. due to reduced air density operates as though 375 h.p. was the maximum possible output at sea level.

The Safe Output of an I.C. Engine.

The stresses to which an engine is subject in running are due to two causes. Of these one is the inertia of the moving parts, and the loads due to this cause depend solely on the speed of the engine. For 2,000 r.p.m. they are the same whether the height is sea level or 100,000 ft.

The second is load due to the actual explosion and compression pressures, and these are directly measurable by the m.e.p. developed by the engine. If the Napier "Lion" can develop 375 h.p. at 2,000 r.p.m. at 10,000 ft., it can do so with exactly the same working stresses—and therefore with the same reliability—as at sea level.

Computation from the known performance at sea level indicates that the engine can certainly develop 335 h.p. at 2,000 r.p.m. at 10,000 ft. The makers themselves give 350 h.p. as the safe continuous output at that height. Therefore if 375 h.p. is a tolerable cruising output at sea level, 335 h.p. is an even more tolerable output at 10,000. Therefore the 10,000 ft. h.p. is to be assessed at certainly no less than $4 \times 335 = 1,340$. The difference of 19 per cent. in the power, compared with that of the turbine, will make a difference of only one or two m.p.h. in the speed, and the contention that the speeds with either power plant would be the same is justified.

The Corrected Figures.

This correction enables the true figures for weight per h.p. of the petrol plant to be arrived at—7.05 lb. per h.p., including fuel, instead of 9.475 as given; and 4.4 lb. per h.p. at the end of the flight, instead of 5.9 lb.

With this as an example of the accuracy with which the known ascertainable facts concerning a well tried petrol plant have been presented, it can scarcely be expected that the estimates for a problematic turbine plant will command much confidence.

Even if they are accepted they should suffice to convince any but the most optimistic aeroplane designer that the plant was impracticable.

A Reply to the Tabulated Claims.

Referring to the tabulated claims (a) to (j) made for the turbine plant, the majority have already been dealt with. Some slightly more explicit answers follow.

(a) *Practical elimination of fire risk.*—This can certainly not be allowed. Petrol is dangerous because, despite the absence of any open flame in the I.C. engine, it ignites so easily that the mere occurrence of a spark may produce fire. Paraffin in contact with the large heated surfaces necessarily present in the boiler will ignite with certainty, and heavier oil with fair ease. Although such a fire would probably be extinguished in a crash by escaping steam, death from scalds inflicted by high-pressure steam has no outstanding attractions compared with mere incineration.

(b), (c) and (d) (Removal of certain points of weakness found only with the petrol engine) must obviously be admitted. But why is it assumed that these more than counterbalance the known risks of failure of the steam system, plus the unknown ones which will supervene when the plant is cut down to weights and sizes permissible in an aeroplane? Something a little more definite than mere assertion is necessary, as has already been pointed out.

(e) *Absolute uniformity of turning moment.*—This is a possible advantage, but it is not entirely a question of the turbine. Flash, semi-flash and other heavily pressed types of boiler have a nasty habit of throwing over chunks of solid water with their steam. This may merely strip a few blades from the turbine, but may cause rather aggravated airscrew flutterings. Airscrews do the falling leaf stunt rather prettily.

(f) *Elimination of vibration and noise.*—This is purely a question of design and balance of rotating parts and gears. The Ljungström type of turbine, used on land for power station purposes, has its two oppositely rotating elements synchronised absolutely by the parallel connection of the alternators, one of which is connected to each element. No details of the exact arrangement of gears which is to be used for this purpose in the aeroplane, is available, but it seems not impossible for distinctly serious surging between the elements—and consequent vibration—to occur if the gear is to be within permissible limits of weight.

Also turbines have been known to vibrate atrociously and to make the most fiendish noise under the most favourable circumstances.

(g) *Elimination of smell.*—Why? An oil-fired steam-ship has a vastly greater capacity for creating a foul stink than has the ordinary petrol motor-boat.

(h) *Vastly improved flexibility.*—The steam plant has a capacity for running steadily at much lower speeds and loads—relatively to normal—than has the petrol engine. But the petrol engine range of speed and power is far greater than the aeroplane can use. Where is the advantage of sweet running at speeds and powers which cannot possibly fly the aeroplane? Also, generally, the fuel consumption of steam plants is far more adversely affected at low load than is that of the I.C. engine.

(j) *Ability to operate on cheap fuel.*—The I.C. engine to burn cheap fuel already exists. In its present form it is no further from a practicable aero engine than is the steam turbine. The difficulties to be overcome in reducing its weight and bulk to limits suitable for aero work are certainly less than in the case of the steam turbine. When it is developed it will be far simpler than any possible steam plant, and more reliable. And finally it will burn only half the amount of that cheap fuel.

Installation Weights.

It is claimed that the bearers for the steam plant can be as light as those for the petrol plant, because of the absence of vibration which has been assumed. Col. Bristow, in his letter, refers to the question of gyroscopic effects when the aircraft is subject to angular accelerations of the order usual

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Extract from THE GLOBE, Dec. 16, 1919.

"The fact remains that it was the internal combustion motor that made flight possible, and the Rolls-Royce motors in particular that enabled these two glorious conquests of the air to be achieved. The Rolls-Royce car is famed throughout the World as a pattern of reliability, but the Rolls-Royce aero engine has now put the coping-stone on the previous successes of the firm, and so noteworthy a double performance is practically without parallel in the history of the world."

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in aeroplanes. These forces must be provided for in the bearers. Such accelerations may be due to either manœuvring or to "bumps." One would scarcely attempt anything like a manœuvre on such a machine as contemplated, but bumps are scarcely avoidable, particularly on a machine which is to fly on at least twice the number of days per annum possible to the petrol-engine type.

(Incidentally the details of the new calendar giving at least 500 days per annum would be of interest.)

The Question of Space.

On the subject of space occupied, I shall certainly make every endeavour to visit any steam turbine plant now in operation which, including boilers, condensers, air pumps, feed pumps, and such like essential auxiliaries, can be packed into the space available on any practicable 30,000-lb. machine, and can then develop 1,500 h.p. Even one which can be put into a 20 ft. cube would interest me intensely—though I can scarcely see it flying unless several I.C. engines are helping it.

With regard to the matter of phrases divorced from their context, I would refer the writers to their use of my phrase concerning the necessity of condensers not being immediately obvious, and to the illustrative statement that 12½ per cent. loss of condensate meant an extra load of at least 1 lb. of water per h.p. hour. Reading their first letter one would assume that I had thought condensers unnecessary, and 12½ per cent loss of condensate normal, though nothing of the sort was stated, or could properly be inferred from my statements. One must assume from the penultimate paragraph of their letter that they failed to understand what those phrases did mean.

Their curious attitude towards the space question presumably is a similar result of non-understanding. One aspect of this was referred to in connection with their previous letter. Another example occurs in their later effort.

What on earth has space for extensions and head room for cranes to do with the matter? The reference was to space actually occupied by the essentials of the steam plant, and I repeat that if they can produce steam plant which can be packed into the space allowable—or even say the 1,500-h.p. plant in a 20-ft. cube, which is certainly not allowable—then the power-station engineer will pay them more for their efforts than the aeroplane builder. I do not say he will pack it into a 20-ft. cube, or that he will not leave room for extensions, or for travelling cranes. I merely say that he will be delighted to know of it and will pay high prices for it and make dividends out of it.

For the rest, I must explicitly say that in this case silence does NOT imply assent. I have specifically assented to such claims as appear admissable. The debatable ones remaining are far too numerous to discuss and deny in detail.

The Power Station Analogy.

Col. Bristow has more temperately stated the case for the steam plant and has allowed it the benefit of the doubt in regard to reliability. Both he and Messrs Richards and Butler agree that the power-station engineer would object to the steam aeroplane plant on the score of reliability, but would object even more strongly to the aeroplane I.C. plant.

I have no doubt he would, because it has become a habit among aeroplane apologists to throw the blame for all aeroplane failures on the aeroplane engine, and the power-station engineer naturally would accept their estimates of its unreliability—having no experience of the type of plant in question.

Speaking from a direct and fairly continuous experience of the performances of steam-power plant as used for electrical generating purposes over the period from 1901 to 1910, and of aeroplane engines as installed in aeroplanes from 1910 to date, I feel certain that the aero engine is not given due credit for its surprisingly good qualities.

The Surprisingly Reliable Petrol Engine.

I am perfectly certain that if a decently designed aero engine of to-day could be installed as a stationary power plant, and rated at its normal cruising power, with its normal maximum output as its overload capacity, would rather startle the average power-station man by its abnormal reliability.

The installation weight would be higher than that usual in an aeroplane, but it would not need to be so high that the total weight per h.p. exceeded the estimated steam turbine weight given by Messrs. Richards and Butler.

A Forgotten Circumstance.

It is not usually remembered that in a power station the plant is under continuous supervision. The slightest trace of irregularity of running is noted, and attended to, and faults which unattended would lead to serious breakdown are frequently remedied before any ill-effects supervene.

All such troubles as are due to choked petrol filters, faulty radiators, ignition troubles, oiled plugs, etc., in the aero engine have their little counterparts in power-station work. They are prevented from being serious by the provision of a very thoroughly duplicated system of auxiliaries and a careful watchfulness on the part of the attendants.

Run under aeroplane conditions of continuous full load with no supervision at all the average power station would break down much more often than does the average aero engine. With power station attention, and with equally careful installation, the aero engine would at least make a very good show against its vaunted superiors.

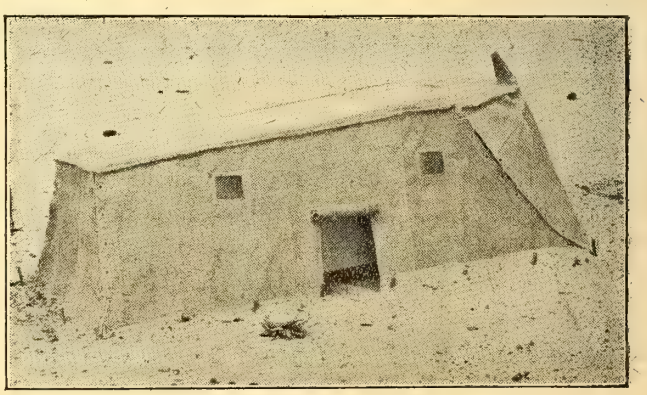
It should also be pointed out that I referred in the comparison not to the use of a specially-designed aero steam plant, as Col. Bristow states, but to standard steam plant, merely devoid of duplicated auxiliaries, and continuously running at its maximum output, with no surplus capacity of any kind available.

Concerning Water Circulation.

Col. Bristow's remarks as to the relative quantity of water circulated per hour for the I.C. engine and the turbine have, of course, a bearing on the problem, but they may be misinterpreted by those unacquainted with the conditions as implying that the condenser and air pump problem are simple compared with those of radiator and circulating pump. The 54,000 lb. of water per hour (for about 500 h.p. turbine) have to be circulated in the form of steam, and when they leave the turbine at a pressure of about 1 lb. per sq. in. absolute the volume is large and the condenser has to deal with this volume. It has in addition to extract from the steam about 1,000 b.t.u. per lb., instead of, as in the case of the I.C. engine radiator, some 20 or 30 b.t.u. per lb. of water.—W. H. S.

IMPROVING ON NATURE.

A well-known aircraft designer, speaking of the Handley Page wing and its claimed results, said that he did not believe it, because if it worked Mr. Handley Page knew more about wings than God did—otherwise the Almighty would have made birds with their feathers arranged differently. The same gentleman doubtless will refuse, on similar grounds, to believe in the appended photographs. Because if they are true, surely the snail would have tucked his house away in his tummy, instead of carting it on his back all the time. The photographs represent the Sablatnig commercial monoplane folded and housed in the tent which it carries about in the body while in the air. A photograph of the machine folded, but in the open, was published in this paper on Nov. 24th last, and this showed the very small space needed for housing. Specifications and a complete description were published with other photographs at an earlier date.



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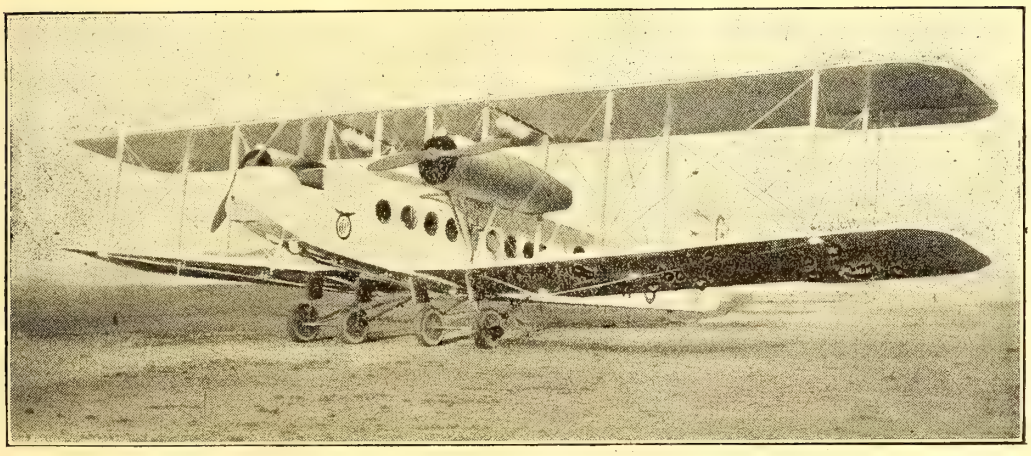

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AIRSHIP PILOTING AND MOORING.

At the meeting of the Royal Aeronautical Society on Thursday, Dec. 2nd, two very interesting papers were read, both dealing with the practical operation of airships.

Air-Marshal Sir Hugh Trenchard, Bart., K.C.B., D.S.O., took the chair.

Major G. H. Scott—the pilot of R.34 on the America trip—lectured on "Airship Piloting," and was followed by Capt. F. L. C. Butcher, who dealt with "Airship Mooring."

Airship Piloting.

Major Scott's paper dealt with the subject of the art of piloting an airship on the broad lines. He dealt with it under four headings: (a) Aerostatics of airships, (b) Aerodynamics of airships, (c) Weather with regard to airships, and (d) Navigation.

Under the first head the subjects of the lift of hydrogen and its amount, the effect thereon of the height of the barometer, of the air temperature, and of superheating were simply outlined. Under the heading of aerodynamics the rate at which resistance and dynamic lift will vary with the size and speed of airships were pointed out, and the advantages which will accrue from enlarging ships were touched on.

A disadvantage, that with increasing size the effects of superheating the gas to a given degree increase more rapidly than the dynamic lift which can be obtained by tilting the ship, is pointed out. The result is that extra ballast must be carried to compensate for the heaviness which results on cooling after gas has been discharged to compensate for the superheat.

With regard to weather, Major Scott stated that the idea that the airship is only a fine-weather craft is not entirely correct. The weather limitations are mainly due to the difficulties of getting in and out of sheds in wind. Once in the air, the airship is not a fine-weather craft.

When mooring arrangements have been properly developed the airship will be almost as independent of weather as the ocean-going liner.

Strong winds are generally due to cyclones, which are approximately circular in form with the wind blowing round in a spiral path. The size of the systems vary from 200 miles diameter to a size covering half the Atlantic. Usually big cyclones are associated with smaller wind velocities, they give more warning of approach, and can be more easily avoided or used.

Except in rare cases—as when the base for landing is in bad weather—a pilot should never beat directly into a strong wind, but should turn broadside to it and go round the central bad area.

The steady beam or head wind of 20-30 m.p.h. is more serious than the very strong wind, for it may endure for a long time over a large area.

Good meteorological reports are needed, so that if necessary the pilot may alter course 12 or 24 hours before meeting them. As an example, if flying from Malta to Norfolk the pilot knew of a depression centred N.W. of Scotland, producing westerly and south-westerly winds over North France and South England, he would fly to pass out into the Bay of Biscay just north of the Pyrenees and, when he met the westerly winds, turn north and be drifted into his objective. This would make a longer course, but a quicker one than if he made direct for his base and had to edge up into a 30-mile-an-hour wind for some hundreds of miles.

To use meteorological data to good advantage the pilot should be able to read the barometer. This he cannot do unless he knows his true height above sea-level—as otherwise he does not know whether movement of his barometer is due to change in his own height or change of pressure at sea-level. At present it is not possible to determine the true height, and some method of doing this is urgently needed.

For navigational purposes information as to changes of wind with height is desirable. Such as is now available refers to clear cyclonic weather conditions, and there is reason to believe that it does not hold good under bad conditions.

The importance of the permanent (trade, etc.) winds to airship navigation were pointed out.

The temperature conditions which are experienced in practice were described, with the effect on superheating—which is a rise in temperature of the gas—due to the direct heat of the sun—to above the temperature of the air. Generally the air temperature decreases and the sun's intensity increases with height, so that the best method of reducing superheat is to fly low and, as cooling is increased by increased air speed, to fly fast.

Under some conditions—as over icefields—the air low down is cooler than up above. If the air is then clear, very high superheats may occur low down. R.34 reached a superheat of 40 deg. F. under these conditions off Newfoundland.

Electric storms are the airship's greatest danger, not from risk of the ship being struck, but because the violent bumps and eddies may damage the structure. Such storms are generally confined to definite areas and occur at particular seasons. They follow definite tracks and some places are entirely free from them. It should be possible to chart areas liable to such storms and to avoid passing through these when warning of the probability of such storms was received. An instrument for detecting the approach of electric storms would be of great value.

Clouds and fog are not serious inconveniences. With present navigational facilities a good course can be kept without seeing the ground. Rain makes the ship heavy, but rain can usually be avoided by changing height.

The chief danger of snow is that of caking on the bow and driving the nose down. Only soft, wet snow will cake, and a rise of 1,000 ft. or so takes the ship into hard, dry snow which will not collect on the ship.

The paper concluded with a statement of the methods available for navigation. As with the aeroplane, these are dead reckoning, sun and star sights, and directional wireless. The only conditions which differ are that the airship is a better and steadier platform for astronomical observations.

Airship Mooring.

Capt. Butcher's paper consisted in the main of a brief outline of the development of airship mooring-out methods, following a description of the difficulties of getting an airship into a shed in a high wind.

The mooring of an airship to a drogue at sea was first described. The experiments made in this direction show that an airship moored to a drogue can be picked up and taken in tow by a ship, and could operate at sea for weeks if the parent ship is fitted with fuel and gas supply arrangements.

Overland mooring has been practised by two methods—mooring by wires and mooring to masts.

Mooring by wires was first developed in connection with small non-rigids early in the war, but the ships then used were not strong enough to stand up to high winds.

In 1917 R.9 returned from patrol short of fuel in a wind too strong to land in. It was decided to hold her out over the landing-ground till the wind dropped, but it was so difficult to keep her steady that she was finally secured to three bollards fixed at the corners of a triangle. The result was so satisfactory that further experiments were made and the three-wire mooring system was developed. This system was used at Mineola during the stay of R.34, and proved a satisfactory emergency system.

The development of the mooring-mast was then traced up to the present time.

It has been proved possible to bring a rigid up to the mast in flight and secure it to the mast in 11 min. from the time of the ship dropping her rope, with only seven men on the landing-gear, to refuel and regas the ship in position at the mast, and to remain at the moorings for six weeks, subjected to winds up to 45 m.p.h.

THE DISCUSSION.

The two papers were discussed together.

Wing-Commander T. R. Cave-Brown-Cave congratulated the two authors on their eminently practical papers. With reference to the two bow-mooring systems for non-rigid airships, he thought the superior results obtained from the horseshoe cradle system was really due to the fact that those who built the trial apparatus of this type had greater resources for manufacture than the makers of the competing system of mooring to a projecting spar. With reference to Major Scott's experience that snow collected on the nose of the ship, he himself had only known it to collect towards the tail. He thought the papers emphasised the importance of airmanship as compared with the provision of good air matériel. R.34's trip to America was a triumph of airmanship, and the present position was that ships could be built of a performance which made possible flights of a type which went beyond existing experience as regards actual handling by their officers.

Col. Gold dealt with meteorological matters. He thought Major Scott had not given sufficient attention to cases of really bad weather. A fortnight ago a full gale was blowing over the whole area from the Shetlands to the North of France, and such a bad weather tract could not be evaded as simply as the cases Major Scott had dealt with. Such bad conditions were not uncommon in these latitudes. South of Paris they were rare.

Capt. Bygrave said that he had recently had an opportunity of making navigational observations on R.33. Compared to the conditions of an aeroplane, the airship offered startling possibilities for navigation. He thought fixes could be made

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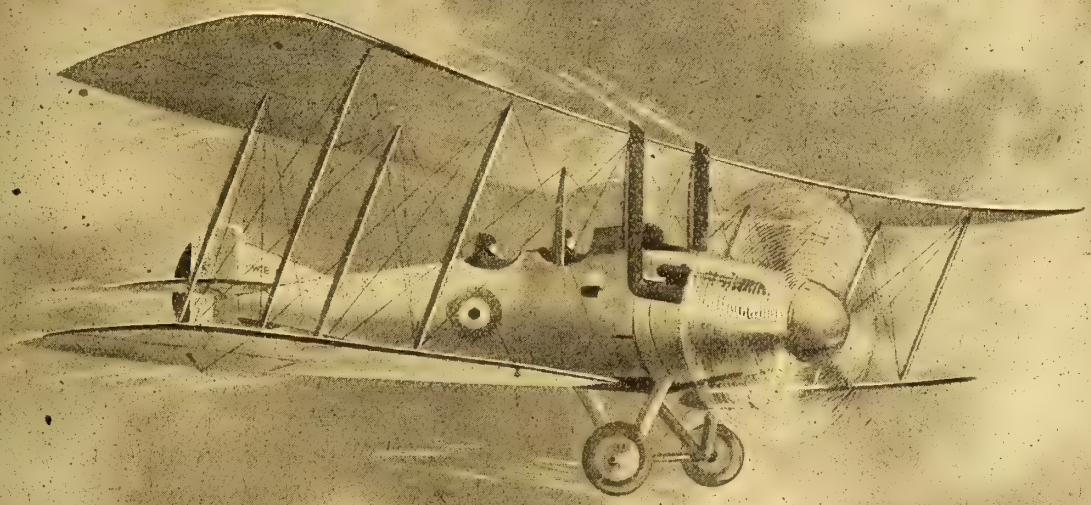

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to three times the accuracy possible in an aeroplane, and nearly as accurately as on a high-speed ship.

Mr. Campbell, of the Airship Design Department, said that these papers dealing with specialised aspects of airships in operation were of vast interest. The airship's value depended on what it could do in practice. The papers showed that although on short trips wind made high regularity of service impossible, on long distance routes a fair degree of regularity should be attained. The speed of the airship was higher than that of weather disturbances, and so it could dodge bad areas. The sea ship was not fast enough for that. The mooring problem was vital. Airships could not be handled on the ground in a wind, and the remedy was to stop 100 ft. above it. This meant mooring out. One could now see through the design difficulties of really large ships, but they were not worth building till the handling difficulty was satisfactorily solved.

Mr. Pannell (N.P.L.) said that one effect of super-heating was to pitch the ship, and this added to resistance. Avoidance of super-heat, therefore, would increase speed and range. As to electric storms, he would like to know what was the evidence that ships had been struck by lightning. Two cases did not seem enough evidence as to the absence of danger. The reference to wind-tunnel tests on mooring systems might mislead. Tests had been made on wire mooring systems, applying forces determined by test on models of ships in the tunnel, but moored models had not actually been put into the tunnel. Finally, he appealed for accurate tests of performance on all existing airships—even obsolete ones which were to be deleted.

Capt. Pritchard said that long pioneer flights were of great value for the data they afforded. On such flights the pilot had to occasionally indulge in original research work at a moment's notice. He showed portrait slides of Major Scott taken on R.34 at the time of encountering the inverted super-heat off Newfoundland. In the first Major Scott had a very worried look, and rightly, for had he not decided promptly as to the action to be taken, R.34 would never have reached New York. The second slide showed him smiling broadly, having decided upon the right course Super-heating was a serious problem, it reduced the paper performance of an airship by 7 per cent. He agreed with Mr. Campbell that the design of airships was ahead of the organisation for handling them, and that the mooring problem was urgent.

Wing-Commander F. M. Boothby wanted information about thunderstorms. What ought one to do if one got into one? He thought the question of mooring out over water required further consideration. If one had to land heavy, as would occur in commercial service, one must land over water and sit on the surface. He suggested flooding Brooklands as an airship harbour.

The Replies.

Major Scott, in reply, said, in regard to snow, this settled on the bow on the old parallel body type ship. It might do it elsewhere on streamline ships. With regard to Col. Gold's remarks as to the existence of very large depressions, he said that one had long notice of them, and could act as necessary. In the cases of two German airships which were struck by lightning, one had the weight on the end of the wireless aerial fused, and the other had some of the bow girders fused. One must run engines in a thunderstorm in order to control in the bumps, and one would want them full on to climb out as quickly as possible.

Capt. Butcher's reply was short, as little criticism had been passed. With regard to Commander Boothby's statements as to mooring over water, he agreed as to the importance thereof, but had little experience.

The Chairman (Air Vice-Marshal Trenchard), in moving a vote of thanks to the authors, said that he had been endeavouring to acquire all possible information as to airships. It struck him that the great difficulty of airship operations was that although the meteorologist knew a lot about winds, he could not give the information really needed, which was the time when the wind was going to blow, where it was going to blow to at that time, and how long it would last.

THE AIRSHIP'S LAST CHANCE.

His Majesty's Airship Station, Pulham, Norfolk, wants Airship Riggers, Aero Engineers, Fabric Workers, Hydrogen Workers (Silicol process). A limited number of men of the above trades are required by the Controller-General of Civil Aviation on a civil engagement.

Applications, giving full details of qualifications, including Service record, together with copy of testimonials, should be forwarded to the Secretary (S.2), Air Ministry, Kingsway, London, W.C.2, not later than Dec. 1st. Preference will be given to ex-Service men and men with Rigid Airship experience. Envelopes should be marked in top left-hand corner with designation, i.e., "Rigger."

It is understood that these men are wanted in connection with the Air Ministry's scheme for running airship lines from England to the Near East.

The much-advertised plans for a commercial experimental line, the ships to be supplied by the Air Ministry and the working arrangements to be made and financed by a combination of steamship and airship firms, has fallen through, as might have been expected seeing that the success of the idea presupposed intelligence and enterprise on the part of the directors of successful business firms. Therefore the Department of Civil Aviation has decided to run the ships experimentally itself, hoping that when it has been proved that airships can operate successfully, some capitalist may be found who retains sufficient intelligence to be wise after the event and finance an airship line in the expectations of a title in return for his services to aeronautics.—C. G. G.

AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 15, 1920.—SIDDELEY "PUMA" ENGINES—DISUSE OF HIGH-COMPRESSION PISTONS.

It is hereby notified:—1. Siddeley "Puma" engines, manufacturers' numbers from 8199-9982, were fitted with high-compression pistons. As the result of Service experience it was decided to convert these engines to low compression by replacing pistons, part No. 703/19, with pistons part No. 703/10a.

2. A considerable number of these engines have already been converted, and can be identified by reference to the log book or to the statement stencilled on the crankcase.

3. Ground engineers operating should ensure that all "Puma" engines in use or intended for use in civil aircraft are converted as above. In all such cases the letters "H.C." on the crankcase and the compression ratio figures on the instruction plate should be defaced and a note inserted in the log book.

4. After converting an engine to low compression a test run of at least 30 minutes' duration should be made, and if lubrication and pistons appear satisfactory on inspection a short test at full power should be given

5. *No aircraft equipped with a Siddeley "Puma" engine fitted with high-compression pistons can be granted a Certificate of Airworthiness.*

Air Ministry, Nov. 27th, 1920.

QUAINT PATRIOTISM.

The Air League of the British Empire seems to have a curious way of spending its members' money and upholding the reputation of British aircraft. In a four-page leaflet issued by the Air League some time in October, three pages and threequarters are devoted to the recent Air Conference and the remaining quarter of a page is given to a glowing advertisement of the Fokker monoplane.

The writer of the paragraph makes the astounding discovery that the new Fokker monoplane has "only one big wing, whereas in the early days monoplanes had two wings." Quite apart from the fact that even if the two wings are built in one, they still remain two separate wings aerodynamically, this clever writer forgets that the old Blériot and Morane "Parasols" also had their wings built as a single surface.

Thereafter the description eulogises the Fokker because, with an engine of 185 h.p., it "will carry six passengers and two pilots at an average speed of 80 miles an hour." As a matter of fact, what it really carries is five passengers and one pilot, or four passengers in the cabin and a pilot in the cockpit outside. The eulogist forgets to note that the machine takes a run of about half a mile to leave the ground when carrying this load, and "kites" very nearly as far before it can be put onto the ground when landing. Also the 185 h.p. can be pushed up to 230 h.p. for getting off, so that the performance is nothing like as wonderful as it might appear. It is, in fact, almost exactly that of the Avro triplane, which is made entirely out of wartime standard parts

One admits that the Fokker machine is good, but, before the Air League starts spending its subscribers' money on advertising the products of the clever young Dutch-German designer, who cost us so many good lives during the war, it might do something in the way of advertising British products. When it has impressed on its subscribers the excellent performance of the D.H.18 as a passenger carrier, and the extraordinary regularity of the old twin-engined Handley Pages, and the amazing speed of the Martinsyde "Semiquaver" and the Nieuport "Goshawk," and the extraordinary advances made possible by the tests of the Vickers, Supermarine and Fairey Amphibians, and when it has persuaded all its subscribers to take a practical interest in aviation by doing a little flying at Croydon or Cricklewood, then it will be time enough for the Council of the Air League to spend money on advertising foreign products.

If the Air League wants to do really useful work, let it set to work seriously to convince the British Public that air lines are a business proposition. Let it hold meetings in commercial centres and tell its audience about air mails and air parcels' deliveries. That will be better than publishing stale news out of daily papers.—C. G. G.

B.T.H.—the Quality Magneto

at the Air Ministry trials at Martlesham Heath

Large Aeroplane Class.

First Prize - Not awarded.

Second Prize - Handley Page, Napier "Lion" Engine fitted with B.T.H. Magnetos.

Small Aeroplane Class.

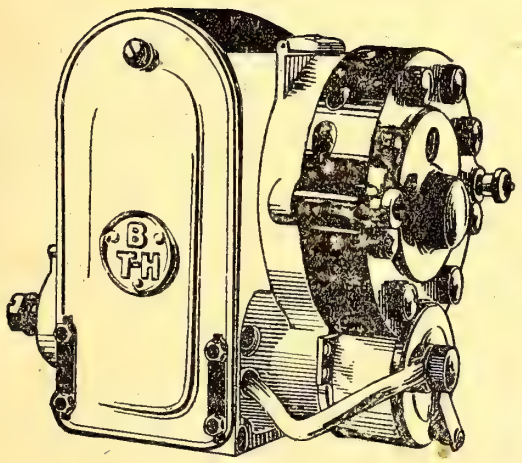
First Prize - Westland Six-Seater. Napier "Lion" Engine fitted with B.T.H. Magnetos.

Second Prize - Sopwith "Antelope." Wolseley Hispano "Viper" Engine fitted with B.T.H. Magnetos.

Amphibian Class.

First Prize - Vickers "Viking III." Napier "Lion" Engine fitted with B.T.H. Magnetos.

Third Prize - Fairey Amphibian. Napier "Lion" Engine fitted with B.T H. Magnetos.



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PARACHUTES AND THE AIR MINISTRY COMPETITION.

By E. R. CALTHROP.

The following is an abstract of the interesting plea made by Mr. E. R. Calthrop on behalf of the parachute, during the discussion on Air Vice-Marshal Ellington's paper at the Air Conference :—

When, in August, 1919, the Air Ministry announced the Rules for a Competition for Aircraft to further the attainment of Safety of Air Travel, these rules contained clauses which made obligatory the carrying of parachutes for all persons, for whom accommodation is provided, including crew. The Judges were requested to have regard to the method of fitting parachutes, and especially to the means of exit by parachute afforded to the occupants of the large machines, and to allot marks for the same.

In the seaplane class, besides parachutes for all persons, including the crew, lifebelts were to be craried. Similar instructions were given to the Judges as to the fitting of parachutes and means of exit, and for the allotment of marks.

But when the revised rules were issued some months later, all the clauses relative to the carrying of parachutes had been struck out, and in the recent trials at Martlesham Heath, I believe I am correct in saying, no parachutes were carried by any aeroplane or seaplane entered and flown in either competition.

So far as I am aware no explanation has been made public by the Air Ministry as to the reasons by which they were actuated in withdrawing, in the case of a competition in which the attainment of safety to passengers and crew was the avowed principal object, the clauses relating to the carrying of parachutes.

I think these reasons should be forthcoming, as the withdrawal excited remark and has given colour to the supposition, which prevails amongst many people, that the Air Ministry, opposed as they and their predecessors the Air Board were to the use of parachutes on aeroplanes in the war, were again opposed to the use of aerial life-saving apparatus on civilian aircraft. For myself, I believe this impression to be ill-founded; but nevertheless it is widely prevalent.

In this connection, I think it right to draw attention to the fact that had these clauses been retained, the "Centaur" machine, which had carried out her trials in the competition, and subsequently crashed at Hayes, would have carried parachutes for all her crew and passengers, and the means of their exit would have been carefully studied for use in such an eventuality as that which actually happened with six fatalities.

So far as the meagre evidence produced at the coroner's inquest went, it would appear that the machine, from some unexplained cause, got out of control at a height of something over 1,000 feet, and although it may be that all would not have been saved in a fall from that comparatively low height, two or three ought to have been, and their evidence would have been of value in determining the cause of the catastrophe.

[One disagrees entirely with Mr. Calthrop in this instance. In such an accident as this nobody except the pilot would know that anything was wrong till the machine actually hit the ground. And the pilot would be too busy trying to regain control to think of telling the passengers to jump. And if he told them to do so they would not have done it. One is convinced that parachutes will only be used in case of fire in the air or in the case (a very remote possibility) of the wings falling off an aeroplane at 10,000 feet, a height which no commercial machine is likely to reach.—C. G. G.]

Without doubt, everyone is working in the same great cause—the greater safety of civil aviation—and no one more than myself admires the efforts made in every direction to attain to safer conditions. Flying is already much safer, at all events, than walking about London: but, in no form of transportation, however long established, is there any immunity from accident. It is therefore indisputably the duty of all connected with aviation, high and low—officials at the Air Ministry, the designers and builders of engines and aircraft, the controllers of the transportation companies, down to humble inventors of safety appliances like myself—to pursue continuously the diminution of *risk*.

There are certain risks that can *never* be totally excluded. For a long time yet to come, flying cannot be made so safe that the occasion will never arise for passengers and crew to leave the machine in mid-air. Provision *must* be made for this; and is *not at present being made on any machine whatever employed in civil aviation*! That, briefly, is the situation; and the intelligent man of business quite understands it. When he travels he is out for business and not for adventure, and takes the safest and most certain route.

In my opinion the Air Ministry and aerial transport companies rely a little too much upon the soothing statistics periodically issued of the safety of civilian flying. Crashes and fatal disasters are reported from various parts of the world at the rate of one or two a week, and sometimes they come in a bunch.

These fatalities have a pronounced psychological effect. The official idea seems to be that any not connected with our own civil aviation should not count. But the man in the street does not think like that.

A crash with fatalities is to him a crash—wheresoever, and in whatsoever circumstances it has happened—and he tells himself that if he had been there he would be *dead*! No flying for him—thank you! That is the psychological effect of any fatal disaster—military, civil, stunt, or otherwise, wherever it happens—on the business man whom we all want to attract to air travel.

I do not think it wise in the general interests of this country's aviation, to wait for the carrying of parachutes on civilian aircraft until after an appalling catastrophe to a big machine carrying many passengers spreads horror throughout the land. Then, of course, the carrying of parachutes would be made *compulsory*; but the "big noise" after a disaster always implies want of prevision on the part of those in authority. After such an occurrence it would take a long time to start travel again, even when all machines of every kind were provided with their appropriate life-saving equipment, duly approved by the Board of Trade.

Surely it is pretty obvious that the evolution of the civilian machine and its aerial life-saving equipment should proceed *together*. One would have thought that the Air Ministry would have realised this as a vital necessity, even though it involved stowage room and the carrying of additional weight—as it seems they *did* when the first competition rules were issued.

But why did they retire from that position. They knew it was a sound position and must ultimately prevail. Was it because the aerial transport authorities feared that the mere exhibition of aerial life-saving equipment would "get the wind up" in their passengers and so restrict bookings?

If the Air Ministry from the first had insisted that equipment must be carried on all civilian aircraft it would have been a commonplace in two months, and by now regarded as a matter of course. On sea-liners, life-boats and life-belts do not scare passengers; but, on the contrary, passengers would be scared if they were not there. Boat and belt drill do not terrify passengers on a steamship; nor would the explanation of the methods of using parachutes scare aerial travellers.

[It seems highly probable that the omission of the parachute provisions in the rules for the Air Ministry Competitions was due to a wise recognition of the fact that it was better to tackle the problem of aeroplane design for safety by itself, and not to attempt to impose upon the unfortunate Judges the task of estimating whether a bad machine with good parachutes was better than a good machine with poor ones.—Ed.]

It must be recognised that this job *has* to be taken in hand; and better now while the designs of civilian machines are in a state of flux, than when they are approaching standardisation. Each type of machine, according to its design, will have its particular requirements as regards the encasement and use of parachutes; and the type of parachute selected must conform to the design and requirements of the machine.

I have been criticised by people who do not understand these matters for designing so many different types of parachutes, instead of adhering to a single standard pattern.

The parachute enclosed in these different patterns of containers *is standard*; but it is the containers and methods of operation which vary, and must do, to be best adapted to any particular type of machine.

It is a great pity the aeroplane parachute was not adopted early in the war; for if it had been, all its problem of usage in accident and the best methods of getting away from fired, broken, and uncontrollable machines would have been solved long since; and the experience would now be invaluable in the greater problems with which we are confronted in regard to the big machines carrying many passengers.

In regard to these larger problems, I have tackled them as far as I can go without Government assistance; and I believe that even the biggest problem—of the machine carrying 50 or 100 passengers—is not incapable of a satisfactory solution. The cost of experimental work on the scale now required is quite beyond private provision, and should be met by Government grants.

A beginning must be made in the adaptation of life-saving apparatus to all machines employed in civil transport; and I think the most practical and quickest way of accomplishing what has to be arrived at would be the appointment of a committee under the presidency of the chief technical authority of the Air Ministry: to include representatives of the Post Office; of those responsible for the carrying on of aerial

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transport; of the builders of aeroplanes, seaplanes, and airship; and of outside persons, like myself, who possess a practical knowledge of the design, principles of action, and manufacture of aerial life-saving equipment.

Solutions of all difficult problems of adaptation would quickest emerge from the free exchange of ideas as to what is desirable and required from the traffic and structural points of view. Government, through the Budget of the Air Ministry, should find all the necessary funds for the experimental work required, and no one in the House of Commons, for such an object, would say them nay.

I suggest that the deliberations of such a committee should be open to the Press. In aerial life-saving matters there is nothing that needs to be kept in the dark; and the presence of the Press accentuates responsibility, and would speed up action.

It is desired to educate the ordinary citizen to a fuller use of the new means of transportation, in order that adequate commercial support should lead to the extension of the civilian fleet and the numbers of its officers until they are adequate in numbers to defend London from a sudden attack in the air. Why should not the man in the street be admitted to the experimental tests and demonstrations of aerial life-saving apparatus, so that he might see for himself the means that are being tried and considered to give him additional safety in the air?

Let the demonstrations be carried out at Hendon or Cricklewood, where everyone who chooses can go and see them. A most interesting series of parachute demonstrations and tests could be made from time to time, each with an explanation of the objects of the tests. There is little doubt the Press would be interested themselves in these tests, and would interest their readers in them.

If our civilian machines are to be of any use at all in defending London from a totally unexpected aerial attack, they must be ready for action instantly. With enemy weapons far more destructive than they were in the war, the destruction of defending machines will be immensely greater; and the least that can be done is to see that parachutes are provided and constantly carried for the use of every man of its fighting crew. They must be there and ready for use. Otherwise we shall not only lose many of our own machines, but our best fighting men as well. Let all these problems be thought out and solved while yet there is time. Vigilance and preparedness for instant defence against attack in the air is now what matters more than anything else to us as a nation, and when the time comes the parachute will play no uncertain part.

THE PILOT PARACHUTE.

The following letter has been received :—

Travellers' Club, Pall Mall, S.W., Nov. 5th, 1920.

Sir,—My attention has just been drawn to a letter which appeared in your issue of Oct. 13th, 1920, from Herr Max Unz, of Frankfort, in which he claims that my Autochute Life-Saving Parachute originally described in The Aeroplane and copied into the American review *Science and Invention*, is an infringement of his German, Austrian, Hungarian and Czechoslovak patents bearing date Oct. 30th, 1918.

He also states that he has constructed and practically tested a parachute system similar to mine more than two years ago.

My own experience with the Compound or Auxiliary Pilot Parachute System began in the early part of 1915, and from then onwards I have taken out various patents covering all forms of compound parachute systems and delay mechanisms at various dates up to Oct. 17th, 1918, on which date I patented the details of my Autochute as referred to in *Science and Invention*.

Many of these details have since then been superseded by improved devices and the modern Autochute bears only a general resemblance to the one then described.

Herr Max Unz has stated that his communication is made to avoid any "misunderstanding," an aspiration in which I concur, and I hope my own letter may help to the desired end.

Addendum, Dec. 2nd, 1920.

In your issue of Nov. 10th I notice there is a letter from Mr. Calthrop claiming that his pilot parachute invention anticipates my own and Herr Unz. He also claims that the real inventor of the pilot parachute was M. Pégoud. I do not know when M. Pégoud first employed a pilot parachute or whether he has made any practical use of it; but I first suggested the use of the pilot parachute in a specification of mine of July, 1915. This also is some months earlier than the date Mr. Calthrop quotes for his own first pilot parachute patent.

I am well aware of Mr. Calthrop's specifications of Sept. 16th and 21st, 1918, and Oct. 18th, 1918. So far as I know, he has never brought any of these to the practical stage or submitted them for test to the Parachute Committee, and I very much doubt if even he himself would claim that they were practical devices. An invention, however ingenious, is worthless unless it is practicable.

(Signed) H. S. Holt, Lt.-Col.

[If one's memory is correct, M. Pégoud was killed on active service somewhere about the time when Col. Holt lodged his specification of July, 1915. In any case, the Couade pilot-parachute system was published before the outbreak of war.—Ed.]

A LECTURE.

In a lecture on "Cold-Worked Steels for Aircraft," the fourth of a series of six arranged by the Royal Aeronautical Society, and given in the Mappin Hall, Sheffield, Dr. L. Aitchison, of Birmingham, paid attention to streamline wires, swaged rods and structural steel strips. He instanced specially the advantages which may accrue from the use of cold-worked steel.—B.A.

MISTAKEN IDENTITY.

The attention of the editor has been drawn to the fact that some weeks ago a photograph was issued by the Central News bearing the following inscription :—

"Gordon Bennett Air Race near Paris.—Mr. Tait-Cox's little son standing by his father's machine, which arrived too late to take part in the race."

This photograph showed a small boy in a species of cowboy costume standing besides the British Nieuport racing machine which Mr. R. L. Tait-Cox was to have flown in the Gordon Bennett Race at Etampes, and one gathers that the photograph has been reproduced in British newspapers with the inscription quoted above.

Mr. Tait-Cox, the famous Nieuport pilot, desires it to be known that he is in no way responsible for the subject of the photograph, being (as yet) free from the trammels of matrimony. The small boy who appears in the photograph was in fact parading the aerodrome at Etampes in the character of the mascot of the machine brought to France for the Gordon Bennett Race by Mr. S. E. J. Cox, the quaint American who provided us so much innocent amusement at the race meeting. Whether he is the son of Mr. S. E. J. Cox, or merely a mascot-child engaged for the occasion, one does not profess to know; but, at any rate, he had and has nothing to do with Mr. Tait-Cox, and it is difficult to understand why he should have been photographed with the British Nieuport machine as a background.—C. G. G.

AN AERO PLUG.

One of the best of the accessory stands at the Olympia Motor-cycle Show was that occupied by the A.C. Sparking Plug, of Thurlow Place. They had a device on the principle of the famous Nestle's milk electric signs, sparking plugs being used instead of electric lights. They showed numerous plugs of all shapes, sizes and ages.

One plug out of a set of the first A.C. plugs used was "lifted" by a souvenir hunter. The firm request that the lifter either remove the remainder to make up the set for him, or else return the odd one to make the firm's set complete.

An important feature of the firm's exhibit was Mr. Brotherston, without whom no show at Olympia, not excluding jamborees and circuses, is complete.—G. D.

COMPANY NOTICES.

New Company.

Welsh Aviation Co., Ltd.—Private company. Registered November 26th. Capital, £5,000 in £1 shares. To take over the business of aviation carried on at Swansea by F. G. M. Sparkes and E. A. Sullock. The first directors are T. W. Jones, 14, Brynmill Crescent, Swansea; D. Dill, 88, Bryn Road, Swansea; G. Rowe, Aelyrbryn, Morriston, Glam.; F. G. M. Sparkes, 10, Alexander Terrace, West Cross, Glam.; E. A. Sullock, 4a, Rosemount, Oxton, Birkenhead; C. H. Mills, Callencroft, Mumbles, Glam. Registered office, 31, Fisher Street, Swansea.

Receivership (Appointment).

Davidson Wood Working and Engineering Co., Ltd. (formerly Davidson Aviation Co., Ltd.).—J. H. Stephens, of 6, Clements Lane, E.C., as receiver, on Nov. 19th, 1920, under powers contained in debenture dated Dec. 4th, 1919.

Mortgages, Charges and Satisfactions.

Lang Propeller, Ltd.—Issue on November 17th, 1920, of £1,000 debentures, part of a series of which particulars have already been filed.

The "BRISTOL" Three-Seater Tourer.

The Old Time Table—and the New.

	By Rail and Sea.		By Air at 80 m.p.h.	
	Depart.	Arrive.	Depart.	Arrive.
London to Paris	11.00 *a.m.*	7.25 *p.m.*	11.00 *a.m.*	1.30 *p.m.*
Cardiff to Aberdeen	3.10 *p.m.*	7.50 *a.m.*	3.10 *p.m.*	7.55 *p.m.*
London to Glasgow	1.15 *p.m.*	10.15 *p.m.*	1.15 *p.m.*	5.25 *p.m.*
Bristol to Sheffield	10.15 *a.m.*	2.44 *p.m.*	10.15 *a.m.*	12.00 *a.m.*
Plymouth to Norwich	12.30 *p.m.*	7.50 *p.m.*	12.30 *p.m.*	3.55 *p.m.*
Rhyl to Brighton	10.5 *a.m.*	5.55 *p.m.*	10.5 *a.m.*	12.45 *p.m.*
Reading to Newcastle.	11.52 *a.m.*	7.24 *p.m.*	11.52 *a.m.*	2.52 *p.m.*

TIME, to the modern business man, has a value reckoned in hard cash. To waste unnecessary hours in getting from place to place is to reduce earning capacity and efficiency. That is why far-seeing business men are using the airways in increasing numbers.

The "BRISTOL" Two and Three-seater Tourer machines are playing an increasing part in the speeding-up of modern affairs.

Theirs is the direct route, speeding along at 90 m.p.h. and increasing to 120 m.p.h. when necessary. There are no delays—sufficient petrol is carried for 6½ hours' non-stop flight — and the record of the Tourer for safety and airworthiness is eclipsed by no other aeroplane.

For all-round efficiency and economy for aerial transport work the "BRISTOL" Three-seater Tourer will bear favourable comparison with any machine of similar capacity yet constructed.

THE BRISTOL AEROPLANE CO.,
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The "Bristol" Aeroplanes

A Wonderful Performance.

One of the finest performances in the history of civil aviation was put up on Saturday, Dec. 4th, by Mr. R. M. MacIntosh, of Handley Page Transport, Limited. He left Paris on a D.H.9 (Siddeley "Puma" engine), with an American officer and his wife as passengers, in the teeth of the gale that was then blowing, and, despite the high speed of the machine, took three hours and twelve minutes to reach Lympne.

The voyage was one continual fight against a full gale, which at times reached hurricane force. The distance from Paris to Lympne is in the region of 180 miles, so that the average wind against the machine must have been at least 50 miles an hour. The greatest force was met in crossing the Channel, which portion of the voyage took 55 minutes.

Mr. MacIntosh made a perfect landing at Lympne, but just as the machine touched the ground it was hit by a gust which lifted it several feet and dropped it on its nose, where it remained with the tail in the air threatening to blow over every moment. It was held down with the greatest difficulty by such hands as were available and the passengers and pilot extricated themselves safely. Thereafter the machine was pulled back into its proper position, the only damage being a broken airscrew.

Mr. MacIntosh is to be congratulated, not only on his pluck in facing such a gale, but on his skill in getting through safely. Also the "Puma" engine deserves its share of praise for standing up to the shaking it received when the machine was thrown about by the gale.

A particularly interesting point about the journey is that on that day no boats were able to cross the Channel on any service in any direction. The moral seems to be that mails should be all sent by air to assure delivery.

It is also worthy of note that the H.P.T. Company's machine in the opposite direction, piloted by Mr. Vaughan Fowler, did the journey from Cricklewood to Paris in one hour 48 min. The machine in this case was a D.H.4a with a Rolls-Royce "Eagle" engine.

Aeroplanes and Fishing.

The Cornwall Sea Fisheries Committee, at a meeting on Nov. 24th, decided to call the attention of the Minister of Agriculture to the great uncertainty existing as to the movements of fish and to suggest that aircraft patrols might facilitate the discovery of the shoals.

Col. Cornish said that the Committee could not afford to supply an aeroplane and crew for this work, nor could the fishing companies; but it should be possible to arrange for this to be done by the Royal Air Force.

The chairman, Mr. Mathias Dunn, advocated the employment of kite-balloons from patrol vessels, and stated that Handley Page, Ltd., had written suggesting profitable possibilities lay in this idea.

Brooklands.

The first machine of the Vickers "Viking," Mark IV type, is now in the drawing-office stage at the Vickers Works at Brooklands. The "Viking IV" will be slightly larger in span and overall length than its predecessors, "Vikings" I, II and III The five passengers will be seated in an enclosed cabin, and the lifting capacity will be greater. At present one does not know what engine will be fitted.

The Instone "Vimy" has received a thorough overhaul and new engines. It was still at Brooklands on Dec. 4th.

The D.H.6 aeroplane (90-h.p. Curtiss engine), belonging to Mr. W. G. Chapman, of the Leatherhead Motor Works, which run the Leatherhead Aviation Services. This machine has done much pleasure flying at Croydon of late. One of Mr. Chapman's mechanics (of considerable age, but an ardent aviator) is seen with the machine.

The "Vimys" destined for China are practically complete in number, and the "Vims" (instructional "pusher" biplanes) are engaging the attention of the works.—J. F. S.

Weybridge.

Lang Propeller, Ltd., have been advertising lately in the local Press for "propeller shapers." On inquiry one was informed that this does not mean that the firm have received any additional orders for airscrews, but that a "change of men" necessitated the employment of fresh hands. The works manager reports that Lang Propeller, Ltd , have very little airscrew work to do at present, only turning out a little more than a dozen airscrews per week.—J. F. S.

Woking.

Apparently Martinsyde, Ltd., are organising a new system of working by which their output, it is hoped, will be increased. The aircraft side is not dead, but in a stagnant condition, and a small amount of flying is carried on from time to time at Brooklands. Mr. R. H. Nisbet continues his good work in Canada until the early spring, when it is thought he will return to England.—J. F. S

THE BRITISH DOMINIONS BEYOND THE SEAS.

AUSTRALIA.

The Australian Aerial Derby.

A cable has just been received by A. V. Roe and Co. from Australia, informing them that the winner of the first Australian Aerial Derby Handicap was Mr. Nigel Love, late Lieut., R.A.F., who flew an Avro with a Clerget engine.

Congratulations to the Avro people on thus securing the first aeronautical sporting event in the Antipodes.

Melbourne to Perth.

To herald the inauguration of the Directorate of Civil Aviation, and to demonstrate the commercial utility of aviation, Mr. Degaris, a Victorian business man, flew from Melbourne to Perth, a distance of 2,169 miles. He left Melbourne on Nov. 30 in a D.H.9, piloted by Mr. Briggs (late Lieut. R.A.F.), and arrived at Perth on Dec. 2nd, having flown via Mildura, the Murray River Valley, Adelaide and the lines of the Trans-Continental Railway. The total flying time for the journey was 18 hr. 12 min.

NEW ZEALAND.

A correspondent of THE AEROPLANE in New Zealand writes :

Wellington to Wanganui.

Captain R. Russell, of the staff of the New Zealand Flying School (Auckland), who recently flew from Auckland to Wellington, flew from Wellington to Wanganui on Oct. 5th, a distance of about 101½ miles in 72 minutes. The flight was accomplished in a three-seater Avro machine, not the machine in which Russell made his Auckland-Wellington flight.

Leaving the Hutt Park at Petone at 10.7 a.m., Captain Russell registered the following times : passed over Plimmerton, 10.15 a.m.; Paekakariki, 10.20; Waikanae, 10.24; Otaki, 10.34; Levin, 10.43; Foxton, 10.50; Turakina, 11.10; arrived at Wanganui, 11.19.

The flight was a particularly good one because the machine was very heavily loaded indeed. In addition to the pilot the Avro carried two passengers, some mail matter, a quantity of light baggage, and all the ropes and gear connected with the mooring of the machine. The flight is the first between these two towns, and the time taken will probably stand as a record for some time.

A New Aviation Company.

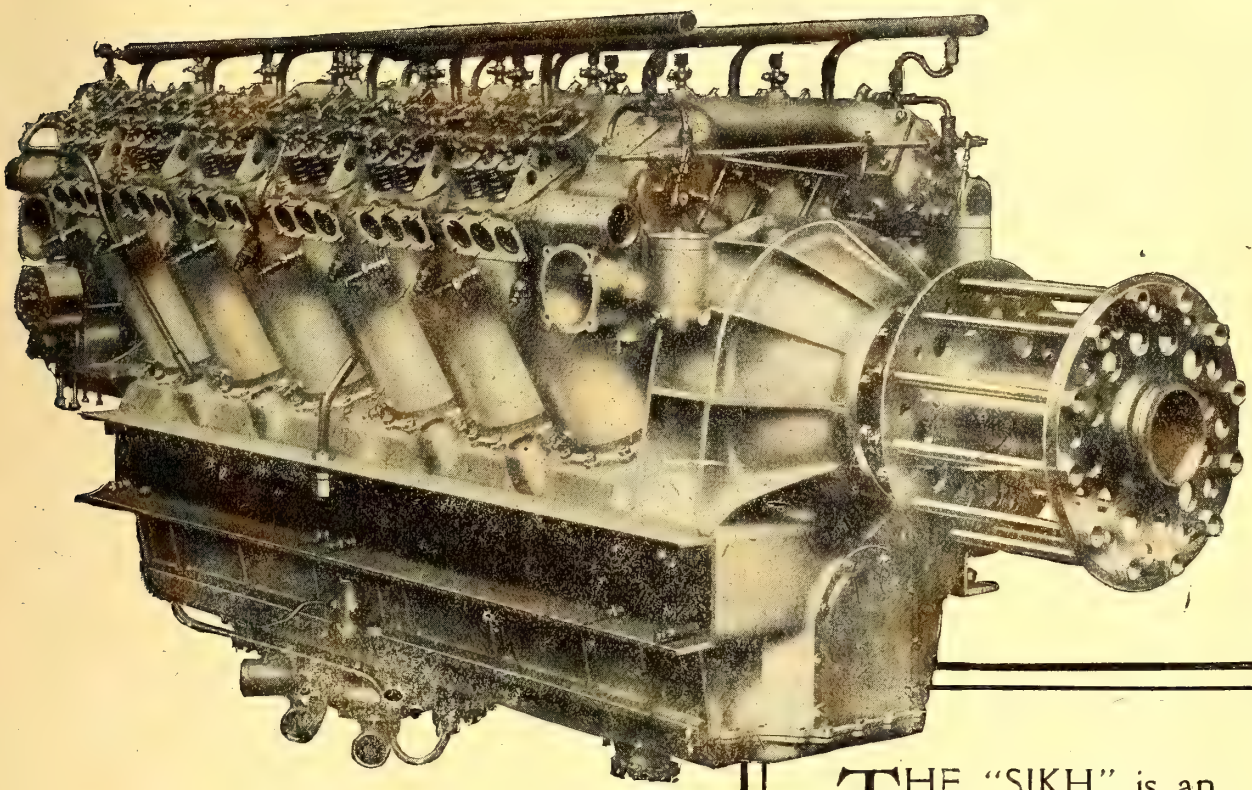
It is understood that the New Timaru Aviation Company is negotiating with Mr. J. C. Mercer, who, by the way, is an excellent mechanic, to take charge of the aerodrome at Timaru. The aerodrome will probably be situated at Washdyke, close to Timaru. The company will start with three D.H.9s and two Avros, but it is believed they are considering purchasing high-powered 'planes with a seating capacity of ten or twelve. These will be used in the Mount Cook tourist trade.—H. B.

SOUTH AFRICA.

A Fast Trip.

Mr. Shirley Solomon claims to have established a speed record in South Africa on August 13th by flying from Beaufort West to Loxton in 36 min. and return in 39 min., a distance of 76 miles each way.

SUNBEAM-COATALEN
AIRCRAFT ENGINES



"SIKH"
800 H.P. AERO ENGINE

THE "SIKH" is an engine of very high power and efficiency, specially designed for u e in large aeroplanes. Its hors--power output is the largest yet obtained from a single unit, and its rel ability is up to the highest standard.

The Sunbeam Motor Car Co., Limited,
M orfield Works. Wolverhampton.

AIRCRAFT IN PARLIAMENT

Nov. 30th.—The following oral answers were given:—

R.A.F.—DRAWINGS AND SPECIFICATIONS (EXAMINATIONS).

Mr. CHURCHILL, in reply to Sir W. Joynson-Hicks, said that the Sub-Section of the Air Ministry known as R.D., is responsible for advising the acceptance or rejection of highly technical drawings and specifications submitted by manufacturers of aircraft to the Air Ministry, but that the decision in those cases does not rest with this Department. The Section is staffed with officials of suitable technical qualifications and experience, and its services are supplemented by those of a special consultant. The qualifications of individual members of the staff could not conveniently be discussed in the House.

ALLEGATIONS AGAINST OFFICIALS.

Sir W. JOYNSON-HICKS asked the Secretary of State for Air whether he is aware that on March 11th, 1920, the Air Council came to the conclusion that there existed a prima facie case for appointing a Committee to inquire into the allegations of a certain aircraft firm to the effect that certain Government officials who by reason of their office received technical information from the company concerned had made improper use of that information in connection with patents subsequently taken out by them, and that they used their position to hinder the development of the company's work for other than reasons of public policy; and whether he will suggest to the Committee that their inquiry should be open to the public and the Press, and that such witnesses as the Committee may see fit to call should be allowed the assistance of counsel or solicitor if they so desire.

Mr. CHURCHILL: The answer to the first part of the question is in the affirmative, and to the second in the negative. The object of the Air Ministry has been to ascertain in the simplest and most direct manner, not whether certain Government servants had acted illegally, because there was no question of this, but whether they had acted in such a way as to prejudice the interests of a private firm. For this purpose a Committee was set up by agreement, consisting of representatives of the Air Ministry and the commercial interests concerned under an independent chairman; and it was further agreed that their inquiry was to be without prejudice to the legal rights of any of the parties. Such a body was evidently never intended to exercise judicial functions, and I do not see my way to ask the Committee to change the character of the inquiry which has been entrusted to them.

The Controller of Patents, after a lengthy public hearing under the Patent Acts, has just decided that Mr. Mooney's patent was not infringed by the Government officer (Major Wylie), who took out a subsequent patent. It may be anticipated that the Committee at their next meeting will hold that this decision disposed of the first of the two terms of reference.

Sir W. JOYNSON-HICKS: Having regard to the fact that all these allegations are made against officers of the Air Force, would it not be better in the interests of the officers themselves, as well as those who make the complaint, that the matter should be discussed publicly?

Mr. CHURCHILL: I do not quite see any sufficient reason to depart from the regular procedure we are adopting. If you were to have a public inquiry in every case where allegations are made against British officers there would be hardly any means of getting through the business.

Sir W JOYNSON-HICKS: Is my right hon friend not aware that the allegations here were made by the Society of Aircraft Constructors, who alleged that there was a prima facie case?

Mr. CHURCHILL: They have their legal rights, and if they choose to make allegations of that character which infringe the law they will be themselves liable to have these allegations tested in the courts.

[NOTE.—It would appear that Mr. Churchill was not fully informed in his answer to these points. One is informed that the question of infringement was not before the Comptroller of Patents, and the opposition (it was not the Steel Wing Co.'s) was successful to the extent that the Comptroller ordered three very important amendments to be made in Mr. Wylie's Patents. The Comptroller used the following words in his judgment:—

"I am not prepared, and I do not think it within my province, to decide whether the present specification (i.e., Mr Wylie's) has sufficiently explained the principles upon which these constructions are based. I think that it is a matter for the Courts hereafter if their aid is invoked, as it would require special evidence as to the utility and possibility of construction."

Mr. Churchill seems also to have been misinformed as to the effect of the Comptroller's judgment on the Enquiry which is proceeding. The following is an extract from the Comptroller's judgment:—

"A good deal of evidence and argument at the Hearing was directed to the question of the propriety of the officials of the Air Ministry applying for patents for inventions relating to subjects regarding which they are brought in their official capacity into relationship with private firms and inventors, and to the question whether or not Mr. Mooney's firm were treated with fairness and frankness by officials of the Air Board and the Air Ministry in the matter of the supply of information and otherwise With those general questions, however, I am not here concerned, and I understand that they are likely to form the subject of an investigation elsewhere."

The precise intention of Mr. Churchill's last statement is difficult to comprehend, for Sir W. Joynson-Hicks' question was framed almost verbatim from terms of reference suggested by Sir W. Robinson, the late Secretary of the Air Ministry, and it was in a letter of Sir W. Robinson's that the word "improper" was first used in connection with this matter.—Ed.]

AIRSHIPS.

Mr. CHURCHILL, in reply to Comdr. Viscount Curzon, said: The Department of Civil Aviation will temporarily take over, as from Dec. 1st, all airships, bases and material, surplus to Service requirements, in order to carry out experimental work of an operational character, such as mooring-mast tests and flights of primary importance, to gauge the ships' capacity for commercial operation. This arrangement involves no modification of policy in regard to the Air Force. The work on which rigid airships have been engaged is that of training Royal Air Force and American personnel and routine work with the Navy. These airships are not in full commission.

In reply to a further question, Mr. CHURCHILL said: We are keeping as many airships as we can possibly afford for work with the Navy, but we have more airships than we can afford to man and staff in the Air Force, and these are being used experimentally by the Civil Department, and we should be very glad if commercial firms would come forward and take them over.

EX-GERMAN AIRSHIPS.

Mr. CHURCHILL, in reply to Viscount Curzon, said: No flights have been carried out so far with ex-German airships. The experiments conducted with them have taken the form of investigating German methods of design and construction.

ACTION BY THE ALLIANCE AEROPLANE COMPANY.

An action by the Alliance Aeroplane Co., Ltd., to recover £5,000 from the Union Insurance Society of Canton, Ltd., for the loss of the Alliance biplane G-EAGL, which was entered for the flight from Great Britain to Australia last year, was begun before Mr. Justice Bray in the King's Bench Division on December 6th. Mr. R. A. Wright, K.C., and Sir A. Richardson appeared for the plaintiffs, and Sir John Simon, Mr. Le Quesne and Mr. Hitchinson for the defendants.

It will be remembered that the moving spirit of the Alliance Co. is Sir Samuel Waring, Bart., who obtained his baronetcy in connection with aviation.

For the plaintiffs it was stated that the machine was insured for one month from mid-day, Oct. 13th to mid-day, Nov. 13th. On Nov. 13th, at 11.30 a.m., the machine left Hounslow on the Australian flight, piloted by Lieut. Douglas, M.C., D.C.M., but had got as far as Kingston when the machine crashed, killing both Lieut. Douglas and his second pilot, Lieut. Ross.

When the plaintiffs claimed under the policy, the defendants refused to pay on the ground that the policy covered only the preliminary flights. The defendants took up the position that the aeroplane had started on the Australian flight and had not been insured for that flight. The defendants said that when the insurance was effected it was agreed that only preliminary flights should be covered; that M. Ami Baumann should be pilot, and that the policy was void as there had been concealment of a material fact because the value of the aeroplane was much more than the £5,000 for which it was insured. There was also a provision in the policy dealing with racing, and that at the time of the accident the machine was actually engaged in the race to Australia. The claimants had also furnished a registration lettering which was, eventually, not allotted the machine.

For the defence, Sir John Simon said that the defendants had given, in good faith, a wrong registration title, which led the defendants to believe that they were insuring the sister machine which had flown to Madrid. The stipulation that Baumann was to be the pilot showed that the defendants did not contemplate any part of the Australian race. Baumann was Swiss, and only Australian pilots could take part.

The Court then adjourned.

THE REWARD OF PIETY.

On Dec. 2nd at Stoke-on-Trent, the summons against Oscar Phillip Jones, aviator, of Beckenham, for flying low so as to endanger the public was dismissed. The magistrate found that though a technical offence had been committed no harm had been intended.

The offence occurred in connection with the unveiling of a cenotaph at Stoke-on-Trent. Mr. Jones on that occasion flew at an altitude of 200 ft. in order to drop a wreath.

PROGRESS IN COMMERCIAL AVIATION.

According to statistics just issued considerable progress has been shown during the last year in French commercial aviation.

The aerial routes now exploited extend to 2,812 miles. Last year the aeroplanes travelled 218,750 miles, but for the first ten months of this year they covered 937,500 miles. There was only one accident for each 75,000 miles flown. While last year the number of passengers carried was 960, up to the end of October this year 6,750 had been carried. A big increase in mails is recorded—from 460 kilogrammes of letters in 1919 to 5,210 kilogrammes in 1920, while cargo has increased from 13,980 to 103,330 kilogrammes.

THE ROYAL AIR FORCE MEMORIAL FUND.

A meeting of the Executive Committee was held at 7, Iddesleigh House, Caxton Street, S.W.1, on Thursday, November 25th, 1920, at 3 p.m., Lord Hugh Cecil in the Chair. Among the members of the Committee present were:—

Dame Helen Gwynne-Vaughan, A.V.M., Sir John Salmond, K.C.B., Air Commodores Longcroft and Brooke-Popham, F. E. Rosher, Esq., H. E. Perrin, Esq., and W. S. Field, Esq.

A list of donations and subscriptions received since last meeting, on November 4th, was submitted.

The Secretary reported that he had duly taken over from an Officer of the Air Ministry the two houses at Ascot, namely, "Heath End" and "Woodcote," being the generous gift made to the Air Council by Mrs. Salting (and by the Air Council handed over to the Fund), with a view to the sale of the properties, the resulting sum to be utilised in founding scholarships for Officers' Sons, at approved Schools. It is hoped to effect this sale (which is in the hands of Messrs. Hampton & Sons), about Easter next year.

The R.A.F. Memorial again came under discussion, and letters were read from the Dean of Westminster and Canon Carnegie of St. Margaret's Church, as to the proposed site near Westminster Abbey, but nothing definite could be yet arranged. Meantime, the Chairman was requested to write to the Office of Works, asking them if they could suggest, and offer, any suitable sites in London, and the Chairman was further requested to write to the Admiralty and War Office to ascertain whether the Navy and Army had any purpose of erecting a Memorial to the Sailors and Soldiers who fell in the War.

With regard to the opening of a campaign in the provinces, for raising funds, the Secretary was directed to proceed to Manchester early in December, to make preparations for a public meeting, which it is hoped to arrange for about the third week in January.

The complete scheme of co-operation with other societies dealing with relief of distress to members of the Navy and Army, has been inaugurated, and comes into force at once.

The Secretary received instructions from the Committee to issue the

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first Annual Report of the Fund, the same to be made up to Dec. 31st next, and to give a complete record of the activities of the Fund during the past year, and of course, showing the exact financial position. It is hoped to issue this report about the end of January, if circumstances permit.

The question of starting Squadron Aid Societies, to be closely affiliated to the Fund, was discussed, but was left over for final decision at the next meeting

At the conclusion of the business of the Committee, Brig.-General R. H. More, secretary of the United Services Fund, who had been invited to attend the Committee, made a statement setting forth with much clearness the aims and objects of Lord Byng's Fund, and affording the Committee much useful information.

The next meeting of the Committee was fixed for Thursday, Dec. 16th next

	£	s.	d.
Amount of donations and subscriptions announced up to Nov. 4th	102,000	9	4
Amount since received up to Nov. 24th	388	7	10
Total	£102,388	17	2

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

Lieut.-Colonel H. T. Tizard, A.F.C., Fellow, will take the chair at the next meeting, which will take place at 5.30 p.m. on Thursday afternoon, Dec. 16th, at the Royal Society of Arts, John Street, Adelphi. Abstracts of two papers will be read: "Possible Developments in Aircraft Engines," by Mr. H. Ricardo, A.M.Inst.C.E., M.I.Aut.E., and "The Installation of Aeroplane Engines," by Mr. A. J. Rowledge, A.M.I.Mech.E., M.I.Aut.E.

Owing to the advent of Christmas, there will be no other meeting until Jan. 20th, 1921, when the Right Hon. the Lord Montagu of Beaulieu, K.C.I.E., C.S.I., A.M.Inst.C.E., A.M.I.Mech.E., will read a paper on "The Cost of Air Ton-Miles Compared with Other Forms of Transport."

DONATIONS.

The Council desire gratefully to acknowledge the gift of "Fifty Years of Travel by Land, Water and Air," by Frank Hedges Butler, F.R.G.S., from the author; "Aircraft: Its Development in War and Peace and its Commercial Future," by Evan John David, from Mr. E. Charles Vivian, both of which have been placed in the Library, and also a large number of back numbers of the "Aeronautical Journal" from Sir Charles Bright, F.R.S.E., M.Inst.C.E., which are out of print and in much demand.

BINDING CASES FOR THE JOURNAL.

Arrangements have been made for the binding of complete sets of the Journal for 1920 in blue cloth cases with gilt lettering at a charge of 4s. 6d. per volume, including the supply of the case. Members who desire to take advantage of this arrangement should forward their sets direct to the Lewes Press, Ltd., High Street, Lewes, at the same time sending a remittance for 4s. 6d. to the Secretary at the Society's Offices. A note stating the name and address of the sender should be enclosed in the parcel to the binders. The complete volumes will be returned direct to members, postage paid.

JOURNAL.

The December issue of the Journal, now obtainable, contains Sqdn. Leader R. M. Hill's paper on "A Comparison of the Flying Qualities of Single and Twin Engined Aeroplanes," which was referred by the Aeronautical Research Committee to the Society for discussion, in addition to "Night Flying," by Major Cecil Baker, D.F.C., and "The Human Machine in Relation to Flying," by Wing Comdr. Martin Flack, C.B.E.

W. LOCKWOOD MARSH,
Secretary.

Dec 3rd, 1920.

PERSONAL NOTICES.

ENGAGEMENTS

HENDERSON—DEBENHAM.—The engagement was announced on Saturday, Dec. 4th, of Col. G. L. P. Henderson, M C, and Miss Cicely Debenham.

REID—PHEYSEY.—The engagement is announced between Allan Tilbrook Reid, late R.A.F., third son of the late Mr. and Mrs. Robert Reid, of Campanha, Oporto, and Audrey Noële, only daughter of Mr. and Mrs. Herbert W. Pheysey, of Oporto.

MARRIAGES.

REYNOLDS—WOODINGTON.—On Nov. 27th, 1920, at Saint Paul's, Durban, Arthur Edward Reynolds (late R.A.F.), of Johannesburg and Shepstone, was married to Phillis Mary, only daughter of Harry and Mary Woodington, of 16, Leopold Road, Wimbledon, by the Rev. Canon Fentow.

WHITELEY—BORROW.—On Nov. 5th, at the Cathedral Church, Rangoon, Capt. Francis Whiteley, late R.A.F., was married to Violet Borrow, elder daughter of Lieut.-Col and Mrs. Frank Johnson, by the Rev. Evans Price, M.A.

BIRTHS.

BELLI-BIVAR.—On November 4th, at Enderby, British Columbia, the wife of Captain Roderick Belli-Bivar, late R.A.F., of a son.

JENKINS.—On Nov. 15th, at Micomi, Florida, U.S.A., the wife of Lieut.-Col. F. H. Jenkins, O.B.E., M.C., late R.A.F. (Fernelitte Robertson), of a son.

COMING EVENTS.

DECEMBER.

11th, Sat.—Armament School, Uxbridge. Dinner at Holborn Restaurant at 7.15 Hon. Sec. at 32, Old Jewry, E.C.

27th Sqd. Dinner at Criterion Restaurant. Particulars from Mr. E. L. Raworth, Lenzie House, East Parade, Harrogate.

104 Sqdn. Reunion Dinner at the Connaught Rooms, W.C.2. Particulars from Mr. C. G. Jenyns, Services Club, W.1.

16th, Thurs.—R.Ae.S lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Installation of Aeroplane Engines," by A. T Rowledge.*

18th, Sat.—Felixstowe Air Station Reunion Dinner at the Connaught Rooms, W.C.2, at 7 p.m. Particulars from Mr W Kitson, 22, Manor Terrace, Felixstowe.

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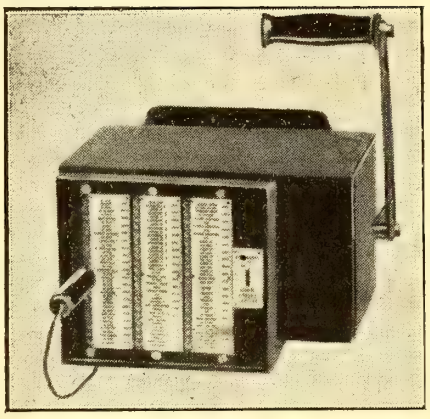

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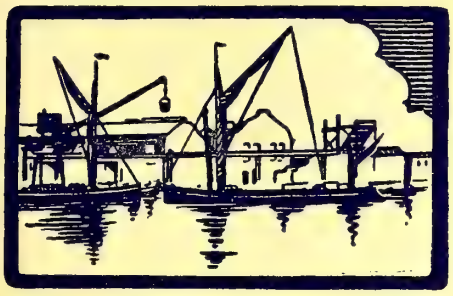

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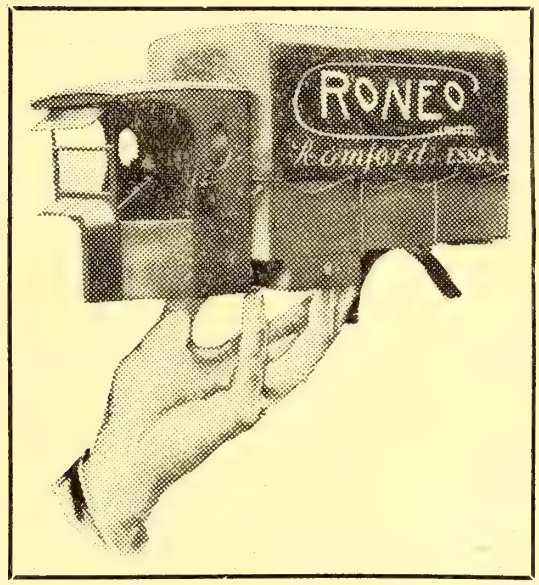

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DEC. 15, 1920.

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ON AIR LINES.—I.

The Sane Outlook.

There are many ways in which the Chinese are superior to Europeans in general and to Englishmen in particular. For example, the word of a Chinese business-man of good repute is better than any signed document in Europe. Also, if a Chinaman becomes great his ancestry is ennobled for so many generations back according to his greatness, on the logical reasoning that if he is so noble a man his ancestors must also have been noble men. We, on the other hand, ennoble a man's progeny, though we have no guarantee that they will not turn out wasters, as they often do.

But, above all, the Chinaman is most admirable in his logical outlook on life, as, for example, the famous Mandarin who remarked of the recent brief if troublesome war: "We in China pay but little attention to the tribe-fights of Western barbarians." That mine of good stories, and last stronghold of the King's English amid the linguistic Bolshevism of modern journalese, the *Morning Post*, recently published one of the best stories ever told of this pitiless Chinese logic, which story is attributed to General Sykes, who may claim to be something of an authority on China, seeing that he is one of the two or three men (Colonel Mears, of the Westland Aircraft Co., is one of the others or the one other) who have ever walked from China to India—and from Pekin to Simla *via* Tibet at that!

The story runs thus:—General Sykes tells of a certain Mandarin of Peking, to whom an English officer proudly pointed out an aeroplane flying over the city. "Don't you think that's wonderful?" he asked. "Well," said the Chinaman calmly, after a glance at the machine, "the thing is meant to do that, isn't it?"

If only we could induce British business-men and, above all, British newspaper-men to regard the aeroplane in that logical light and treat it accordingly we should be well on the way towards the establishment of air lines as sound commercial propositions. If, instead of getting wildly excited over the transport of pigs to Paris by air—four-legged pigs, that is, not the profiteer variety—or some such unusual though not astonishing event which the "hooligan reporter" can work up into a "stunt with a heart interest," the newspaper-man and the business-man would merely say: "Well, the thing is meant to do that, isn't it?" and carry on with his job, we should be very much nearer aerial transport.

So long as the public, inspired by the newspapers, say "Don't you think that's wonderful?" so long people will refuse to take aviation seriously. What is wanted is a regular newspaper campaign, worked by the Department of Civil Aviation and the Society of British Aircraft Constructors, to impress on the ordinary business-man not the wonderfulness of aviation, but its common or garden utility and to teach him what the thing is meant to do and what it actually does.

Heaven helps those who help themselves, and it is about time these two organisations started on a self-help campaign. And if the daily Press cannot be induced to help, then let these organisations—as suggested in this paper months ago—concentrate on the trade and technical Press of those industries to which air transport can be useful.

The Air Ministry's Half-Yearly Report.

The Air Ministry's report on "The Progress of Civil Aviation" for the half-year April 1st, 1920, to Sept. 30th, 1920, was published on Dec. 10th, and seems to afford an excellent jumping-off place for such a campaign. The material is all there, and it is enough to convince even the fool English business-man who when times are bad refuses to advertise for business from abroad, and when times are good, and he has more business than he can handle, throws money away on advertising goods which he cannot supply.

The report is far too lengthy to publish in this paper, but those who want it can buy it from His Majesty's Stationery Office, or from any bookseller, for fourpence net. It contains 32 pages of reading and tabular matter. Each page is bigger than a page of THE AEROPLANE, and though perhaps not quite so entertaining, it is as full of good solid information as "Sandford and Merton," and quite as satisfying.

The report tells all about relations with foreign countries, progress in ground organisation, commercial services, meteorology, medical services, collection and issue of information, research, expenditure, Imperial air routes, progress in the Dominions, India, and the Colonies, and so forth.

A Few Figures.

Some of the figures are so interesting that it is necessary to quote them here, with one's own comments in brackets. For example:—

Licences to Pilots.—April 1st to Sept. 30th, 1920, New Licences, 95; Total since May 1st, 1919, 579; Renewals, April 1st to Sept. 30th, 1920, 129.

Licences to Ground Engineers.—New, 133; Total, 478; Renewals, April 1st to Sept. 30th, 1920, 90. (This is quite satisfactory.)

Licences to Navigators.—Total, 1. (This is not exciting.)

Certificates of Registration.—New, April 1st to Sept. 30th, 113; Total, 587; Renewals, 150. (This is not very encouraging, but even 113 new registrations since March last is not so bad.)

Number of Machine Flights.—May to Sept., 1919, 31,250; Oct., 1919, to March, 1920, 6,571; April to Sept., 1920, 20,658. (It is curious that there were more flights in five months in 1919 than in six months in 1920. This is chiefly due to the big "joy-ride" campaign by the Avro Co., which has not been operating in 1920. But the following figures show that far more flying has been done this year.)

Number of Hours Flown.—May-Sept., 1919, 6,566; Oct., 1919-March, 1920, 3,061; April-Sept., 1920, 8,200.

Approximate machine mileage.—May-Sept., 1919, 460,300; Oct., 1919-March, 1920, 231,600; April-Sept., 1920, 689,600. (That is to say, the total mileage for the year Oct., 1919, to Sept., 1920, inclusive, is about 921,200, or close on a million miles, or, say, 1,500,000 kilometres, against 1,000,000 kilometres in France helped by subsidies.)

Number of Passengers carried.—May-Sept., 1919, 58,132; Oct., 1919-March, 1920, 9,808; April-Sept., 1920, 32,345. (Again the six months of 1920 are lower than the five months of 1919, but again the distances are greater, for the average flight in 1919 was 12 minutes as against 24 minutes in 1920.)

Departures and Arrivals to and from the Continent.—Aug. 26th to Sept. 30th, 1919, 83 departures, 79 arrivals; Oct. 1919-March, 1920, 388 departures, 346 arrivals; April-Sept., 1920, 1,284 departures, 1,191 arrivals. (This gives an average of 100 machines per week across the Channel, without one single fatal accident in the six months.)

Value of Goods Imported by Air.—Aug.-Sept., 1919, £4,501; Oct., 1919-March, 1920, £131,615; April-Sept., 1920, £376,606.

Value of Goods Exported by Air.—Aug.-Sept., 1919, £3,002; Oct., 1919-March, 1920, £63,743; April Sept., 1920, £168,300. (It is to be regretted that the imports exceed the exports. This proves that Continental commercial people are more wideawake than our own. Curiously enough the balance of mail matter is the other way, 46,175 letters having been sent to the Continent by air, as against 40,338 received from the Continent.)

The percentage of successful flights from aerodrome to aerodrome on the London-Paris service was as low as 38 per cent. in Dec., 1919, rose to 96 per cent. in June, 1920, came down to 75 per cent. in the bad weather of July and rose to 85 per cent. despite fogs in September. The London-Brussels service, started in July, shows 75 per cent. in that month, 100 per cent. in August, and 96 per cent. in September. (These are surely convincing figures.)

[POST SCRIPTUM.—The unfortunate accident which occurred on Tuesday (Dec. 14th), just as this paper was going to press, when three people were killed by a Handley Page Transport machine descending on a house at Golder's Green, does not in the least affect the argument of the foregoing figures. Accidents happen in all means of locomotion.—C. G. G.]

Self Help.

The Report gives much interesting information concerning aviation in foreign countries, but naturally what concerns us most is our own success in commercial aviation. This re-

port contains, as already suggested, all the material for an energetic campaign on the business community. Will the Department of Civil Aviation and the S.B.A.C. use its opportunity?

Heaven helps those who help themselves. Already the business community, as distinct from the aeronautical community is helping itself. That very influential daily publication, *Lloyd's List*, which is read by all shippers and underwriters, is now publishing every day the communiqué of the Department of Civil Aviation, under the heading "Movements of Aircraft." It is the first daily to do so, and the names of Mr. Glanville, the editor, and Captain Gillman, late R.A.F., who is his *aide* in this matter, deserve to go down to history for this service to aviation.

This paper, THE AEROPLANE, is doing its best to move the business community in the right direction, by way of the big shipping companies, the best clubs, and by obtruding itself on the notice of all classes of people at home and abroad who are likely to use aircraft. But the Air Ministry and the Trade should do more to help.

Air Traffic Canvassers.

Meantime, our two chief air lines seem to be doing something practical to help themselves, without any aid from the Department of Civil Aviation or the S.B.A.C., both of which ought to be taking a hand in the work in their own interests. One is told that Aircraft Transport and Travel, Ltd., and Handley Page Transport, Ltd., are both sending out canvassers to various and sundry firms in the City of London to endeavour to persuade such firms to send goods by air instead of by rail and boat. And, which is highly satisfactory, one gathers that these travellers are achieving very considerable success.

When one can get the English business-man quietly by himself to listen to common-sense argument, undisturbed by his daily debauch of newspapers and away from his particular political mania, he is often quite a reasonable animal. And so the air transport canvassers have been able to fix some quite useful contracts for goods, which it is hoped will not only keep the lines busy through the winter till the passenger traffic revives, but will convince the consignees to such an extent that the goods traffic next year will be very much greater than it has been in the past.

Our Great Opportunity.

Now above all times is the opportunity of the air lines and of those who wish them well. The Continental railway systems have always been bad, and to-day they are worse than ever they were. Our own railways to-day are little if any better than the Continental railways were before the war. Accidents, fatal and otherwise, on the French railways are more frequent in proportion than on air lines.

Even without accidents the handling of goods is so chaotic and the delays are so appalling, and the chances of loss through thieving are so great, that nobody would send any goods by rail if the safety and speed of air transport were generally known—except, of course, goods of high weight and low value which could not bear the cost of air transport at a shilling a pound. This high price will itself come down to about half when the air lines are equipped with machines with economical wings instead of the quaint survivals of war-time practice which are in use at present. So far, we have only modified our war-time fuselages to commercial use.

It is said that A.T. and T., Ltd., are about to make a bold move towards improving the efficiency of their line by scrapping all their old D.H.9s, and are to start next year with a flotilla of four D.H.16s. and four D.H.18s, all with Napier engines. These machines are, as Mr. Frank Searle remarked at the Air Conference, commercial propositions if ever such propositions existed.

Rumour has it that if this flotilla shows in the first few months that it can pay its way, a whole fleet of similar, or even more advanced, machines will be put into service. There again, if rumour is correct, is a very promising move.

Aircraft Aid to Business

Over and above the opportunity provided by the chaotic condition of land and water transport, civil aviation has a still greater opportunity in the present state of commerce in general. It is true that business is for the moment at a standstill, but that condition is largely artificial, in that money is being deliberately held up, partly because Capital will not be put into use so long as Labour refuses to give value for its wages, and partly because Capital will not be forthcoming so long as its earnings are appropriated by the tax-gatherers of a spend-thrift Government.

As soon as Labour decides to do its job—which will be very soon, now that good workmen who are willing to work are finding themselves out of work because of the ca'canny policy of their Unions—and as soon as the Excess Profits Duty and other imposts are removed by a Government which fears more for its own salaries than for the failure of its high-falutin' Socialistic schemes, then Capital will be available for the rebuilding of British industries, and for foreign trade.

And then British business men will awake to the value of air transport as an aid to extending their business.

An Example and an Argument.

The greatest development of the railways, which had previously been regarded with suspicion as a dangerous and uncertain method of transport, came when after a period of bad trade and semi-starvation and rioting, the business man who held the money realised that rapid transport of goods and people was the best of all ways of increasing his business. But the railways had to convince him that their method of transport was no more uncertain or dangerous than that of the horse-drawn wagon and the stage-coach.

It is up to the Department of Civil Aviation and the S.B.A.C. to help the traffic canvassers of the existing air lines to convince the business community that air transport, at any rate of goods, has actual advantages over rail and sea transport. The task is not easy, but it is not very difficult. It entails steady and intelligent work rather than brilliant publicity.

The position recalls an incident many years ago in the very early days of motoring. One had driven a noisy and rather terrifying motor-bicycle into the yard of an Irish hotel in the prosperous middle South. The ostler, an old man who remembered the days before the railway came to the town, remarked: "Thim's terrible yokes, sorr! The Divil himself wouldn't get me to ride on the like o' that. Sure they're rippin' and roarin' all over the counthry killin' people that niver died before!"

By way of convincing him one reminded him that in the days of his beloved stage-coaches it was not unusual for the brakes to fail on a hill, for the team to bolt to escape being run over by the coach, and for the whole outfit to turn over at the first corner and kill a few of the outside passengers.

The old ostler admitted that people were occasionally killed by the overturning of coaches, but added: "For all that, give me the ould coach. Sure if a coach upsets on ye and ye break ye'r neck, well, there ye are! But if one o' thim dam yokes bursts from undher ye, where the Hell are ye?"

Despite his Irish speech one has always had a suspicion that the said ostler was of English descent, for his outlook was so essentially English. Probably he was the descendant of one of those Englishmen who in Cromwell's or William III's or George II's time were sent over to pacify Ireland by almost precisely the same methods as are being used by the "Black and Tans" of to-day, and whose descendants are providing the back-bone, if not the brains, of the extreme Sinn Fein movement. At any rate there you have a thoroughly good old-fashioned Conservative outlook on mechanical transport. It is just such an outlook that the apostles of air transport have to combat in the British business man to-day.

What has to be done, as already stated, is to convince the business man that there is nothing wonderful about the commercial aeroplane, and to induce him to attain to the same degree of intelligence as the Chinaman who said: "The thing is meant to do that, isn't it?" C. G. G.

(To be continued.)

A NEW SPEED RECORD.

The latest phase in the speed battle between M. Sadi Lecointe, Nieuport biplane (300-h.p. Hispano-Suiza), and M. de Romanet, Spad Herbemont biplane (300-h.p. Hispano-Suiza), results in M. Sadi Lecointe holding the record, for the time being.

On Sunday morning, Dec. 12th, at Villacoublay, flying the Nieuport biplane, which he used in the Gordon Bennett Cup race, M. Sadi Lecointe covered the measured kilometre at a speed of 313.43 km.p.h., or just over 194 miles per hour. The record was only recently gained from M. Lecointe by M. de Romanet with a speed of 309.012 km.p.h.

HELP WANTED.

The editor of THE AEROPLANE would be very glad to hear from any reader in London who could spare an hour or so about one evening a week to translate German correspondence. The question of fees can be discussed when the amount of work to be done has been considered.

CONGRATULATIONS.

From the Notices of Births:—

PAGE.—On Friday, Dec. 11th, at Lymes Holme, Stanmore, Middlesex, to Mr. and Mrs. F. Handley Page, a daughter.

All concerned with aviation will join in congratulating Mr. and Mrs. Handley Page on the safe arrival of this their second daughter. It is a recognised fact that the mothers of a nation are of greater importance than the fathers, and so it is satisfactory to see that daughters are being born to so many of the best people in Aviation, both Service and civilian. It augurs well for the future of the British Empire.

THE AMFIBBY ONE.

Nothing worries the average sailor-man so much as strange words, *H.M.S. Hermione* was commonly known among sea arers as the "Hermy One." And most Naval Officers will recall even stranger and less euphonious names for sea-going craft whose titles when properly pronounced were quite graceful.

To-day a new trouble besets the untutored matelot. The advent of the amphibian aeroplane as a necessary adjunct to any self-respecting Fleet in Being makes it necessary for him to pronounce if not to understand this strange new word.

Already, when the Amphibian Competition was under weigh at Felixstowe, the local seafarers were heard to refer to "Them 'ere amfibby 'uns," and it seems that there was some argument as to the meaning of the adjective "amfibby."

Probably the title "amphibian" is itself erroneous seeing that a real amphibian aeroplane is equally at home in the air and on land and on water, and not merely in or on two of these substances. But whether correct or not, the title is adopted officially. And what matters is whether the machine does its three-fold job or not. Here at any rate is one which does its job.

The Fairey Amphibian Aeroplane Taxying across the Croydon Aerodrome, during the Demonstration to the visitors from the Air Conference.

The history of this interesting old machine has already been published. She has been in use for nearly four years and is still as good as ever. In fact, in her latest manifestation, as an amphibian with a Napier Engine, she is better than ever.

Yet, well as she does her job, and good as is her performance, she is already a back number compared with the latest Fairey Amphibians which are now coming through.

Naturally, the Royal Air Force has first call on all new designs and all priority of production from the Fairey factory. But the firm is prepared to supply aeroplanes, or amphibians, or ordinary seaplanes, or flying-boats to private customers and to foreign governments, and to guarantee that such aircraft as it may supply shall be unsurpassed by similar products made elsewhere either in this country or abroad.

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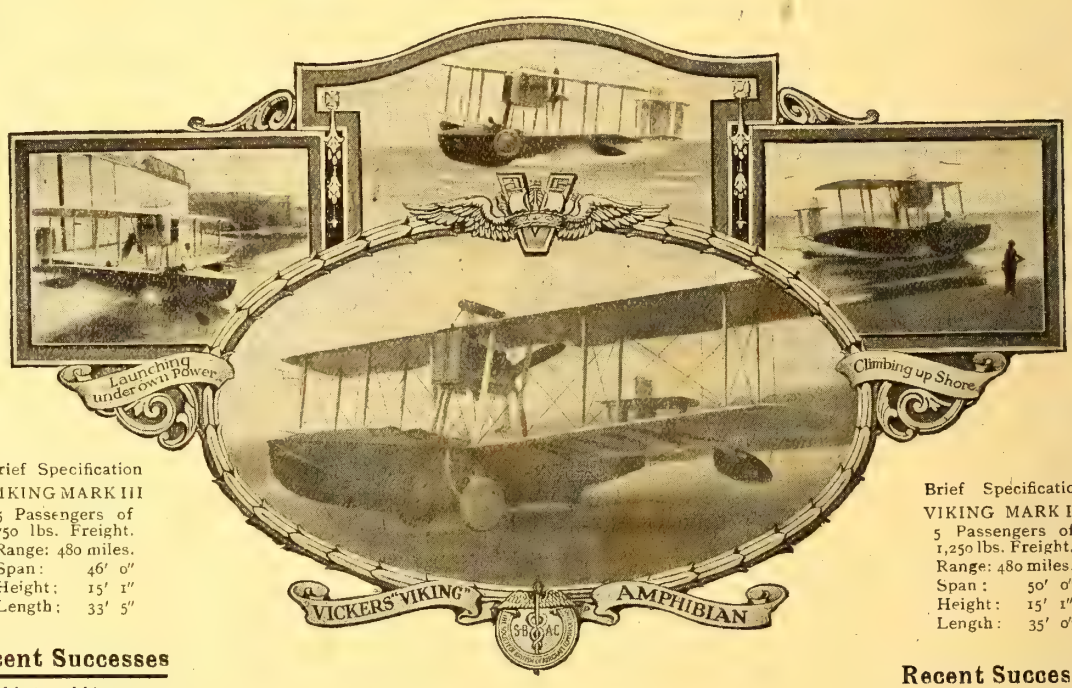

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VIKING MARK III
5 Passengers of 750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Recent Successes

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

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2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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LEEDS—Greek Street Chambers, Park Row.
NORWICH—16, White Lion Street.

Brief Specification
VIKING MARK IV
5 Passengers of 1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

Recent Successes

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION, September, 1920.

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THE WEEKLY COMMENTARY.

In the article below Mr. Hildesheim describes the products of some of the less well known of the German engine builders as they were at the time of the Armistice. This account, taken with the previous article to which reference is made below, will give a fairly good idea of the state of the German aero-engine industry.

An illustrated description of the new Zeppelin Staaken commercial monoplane, which has figured in the daily Press as the "German Mystery-Plane," is given on page 906.

The extraordinarily high loading of the wing, together with the very reasonable landing speed and the high top speed claimed, make this machine unusually interesti-
It has been said by the ill-informed that this is a potential war machine. It is therefore necessary to point out that it could only be used for bombing, and then only if escorted by a number of fighting machines, which fighting machines Germany is prohibited from building. Without an escort it would be about as useful for war purposes as any ordinary passenger-ship at sea would be without an escort of warships.

Some of the very interesting constructional details of the De Pischof avionette are given in this issue. The production of a practicable man-carrying aeroplane with an engine of only 16 h.p. can scarcely lack interest—whatever one may think of the practical value of such a craft.

An American incursion into the field of cantilever monoplane construction—"The Stout Bat-wing" machine —is described and illustrated.

GERMAN AERO ENGINES AT THE ARMISTICE.

By Erik Hildesheim

In the issue of Jan. 28th last an account based on the report of a paper read by Dipl. Ing. Otto Schwager to reveal the trend of German aero-engine design towards the later part of the war, chiefly as to the Vee-type 8 and 12-cyl. models, and concerning the experimental two-stroke Junkers and Hellmuth Hirth engines.

This information can now be supplemented more or less completely by the news below of the work going on at the time of signing the Armistice in the various German motor works and gives a full view of the present aero-engine position in Germany, as none of the firms are at present allowed to carry on engine building.

But as the result of attending a paper, read at the last session of the scientific and aeronautical body in Berlin, the Wissenschaftlichen Gesellschaft für Luftfahrt, one may safely state that experiments are now being carried out to develop the two-stroke aero-engines in a number of cases.

M.A.N.

To finish first the review of the standard German 6-cyl. vertical type, the M.A.N. and Opel are newer in name to most people than are the products themselves. For the M.A.N. products—the concern is of course the well-known manufacturer of the German submarine Diesel engines, with a name composed of the two cities where are the works—"Maschinenfabrik Augsburg Nürnberg"—were more or less of the standard type.

The Nürnberg works built the Argus 180 h.p. model As III under licence, while the Augsburg plant produced a 185 h.p. engine of similar layout to the 160 h.p. Mercédès. Only a limited number was supplied, as the performance no longer sufficed by the time that quantity production started. So the engine was re-arranged as a super-dimensioned model, varying only in larger cylinders, with a performance at sea level corresponding to 260 h.p. Mounted in a Pfalz scout D.XII, with prescribed load the engine gave on July 9th, 1918, a performance in two test flights of (first climb) 1,000 m., 3 min; 2,000 m., 7 min.; 3,000 m., 10 min.; 4,000 m., 13 min.; 5,000 m., 17 min.; 6,000 m., 21½ min.; 7,000 m., 30 min.; (second climb) 1,000 m., 3¼ min.; 2,000 m., 7¼ min.; 3,000 m., 10½ min.; 4,000 m., 14 min.; 5,000 m., 17½ min.; 6,000 m., 21 min.; 7,000 m., 29 min.

Opel.

The Adam Opel Motor Works, Rüsselsheim, first built the 180 h.p. Argus engine As III under licence, and later the 185 h.p. B.M.W. IIIa. The firm started developing an engine of its own, but gave up the work in favour of the Bayern engine. The experimental Opel, designed for 200 h.p., was never tried on the brake. In layout it was a 9-cyl. engine, with the cylinders in a three-row arrangement, as if one cut the 18-cyl. Sunbeam type in halves. It was fitted with a reduction gear.

The last B.M.W. model, now well known, is the latest development of the six-cylinder class.

Of the rotaries, the Siemens type has already been dealt with. Its chief competitor at the end of the war was the super-dimensioned 160 (200) h.p. Goebel, which was the power plant of the Fokker and Kondor wireless parasols, as the latter aircraft manufacturing firms would not like to employ the engine product of the Siemens and Halske Blockwerk, when the Siemens-Schuckertwerke plant turned out competing aeroplanes of the same classes.

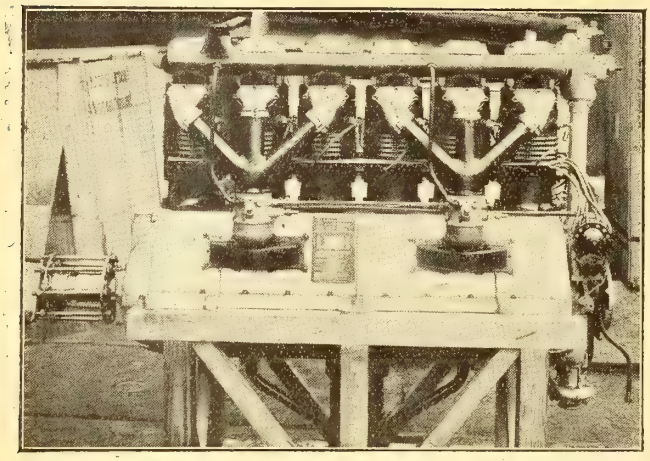
Oberursel.

The Oberurseler Motorenfabrik, near Frankfurt, had before the war taken out a licence for building the Gnome. One cannot refrain from commenting on the coincidence that Oberursel already built motor locomotives and other engine products under the trade name of Gnome as a likely inducement for taking up the rotary manufacture of that make, particularly as the Gnome's doings in Germany had been poor, as it was first employed almost only in the Euler converted Voisin biplanes which were excluded from pure German competitions, and handled later as an agency by the Strasburg automobile manufacturer and sportsman Mathis, it gave no very good results.

When actual manufacture under Gnome licence began, the Oberursel works followed the Le Rhône version, developing from the 9-cyl., 110 h.p. engine a 160 h.p. 11-cyl. engine of good behaviour. The intention towards the end of the war of turning out two special light 160 and 200 h.p. models was not carried out in time for the war. In the before-mentioned article the experimental effort of the Dr. Becker high-speed engine with a special valve gear made by the Oberursel company has already been referred to; here again the Armistice prevented quantity production from maturing, as only one specimen was completed for mounting in aircraft.

Schwade.

Otto Schwade and Co., in Erfurt, before the war built also the aeroplanes for his Gnome copied produced Stahlherz engines, but during the war they made only a limited number of the 100 h.p. model, with which many difficulties were experienced in the acceptance trials. Thus their performance had already become quite inferior by the time they were



The Six-Cylinder "N.A.G." Aero-Engine.

really taken over. Schwade next engaged extensively on the development of the turbo-supercharger.

Goebel.

The Gandenberger'sche Maschinen-Fabrik of Georg Goebel at Darmstadt, the speciality of which is ticket-punching machinery, has during and after the war turned out four models of rotary engines, of which only the highest-powered super-dimensioned edition in limited numbers saw active service before the Armistice.

The 9-cyl. 200 h.p. Goebel engine showed a good performance, but nothing has been heard of the 7-cyl. 30 h.p. sporting model except that the manufacture has been announced and started since the Armistice.

The feature of the Goebel rotary aero-engine is the valve gearing. The exhaust valves are controlled from a single stationary cam, the tappet plungers, connected with the push rods and rocking levers, swing, and once in each second revolution pass the cam, the next time being opened by it. Further, a movable half-compression cam is provided for easy starting and slow running. The auxiliary cam is operated from the pilot's seat.

The pistons are composed of two parts, the steel top clear of the cylinder wall joined to the connecting rod and provided with the rings, and of the lower or skirt part which guides the piston.

The inlet valve is in the piston top and balanced with a counter-weight.

The cylinders are mounted in the crankcase with a bayonet joint and are locked by a pin. The latter as well as the exhaust valve push rod being removed by means of a special key, one twelfth of a turn frees the cylinder from the case.

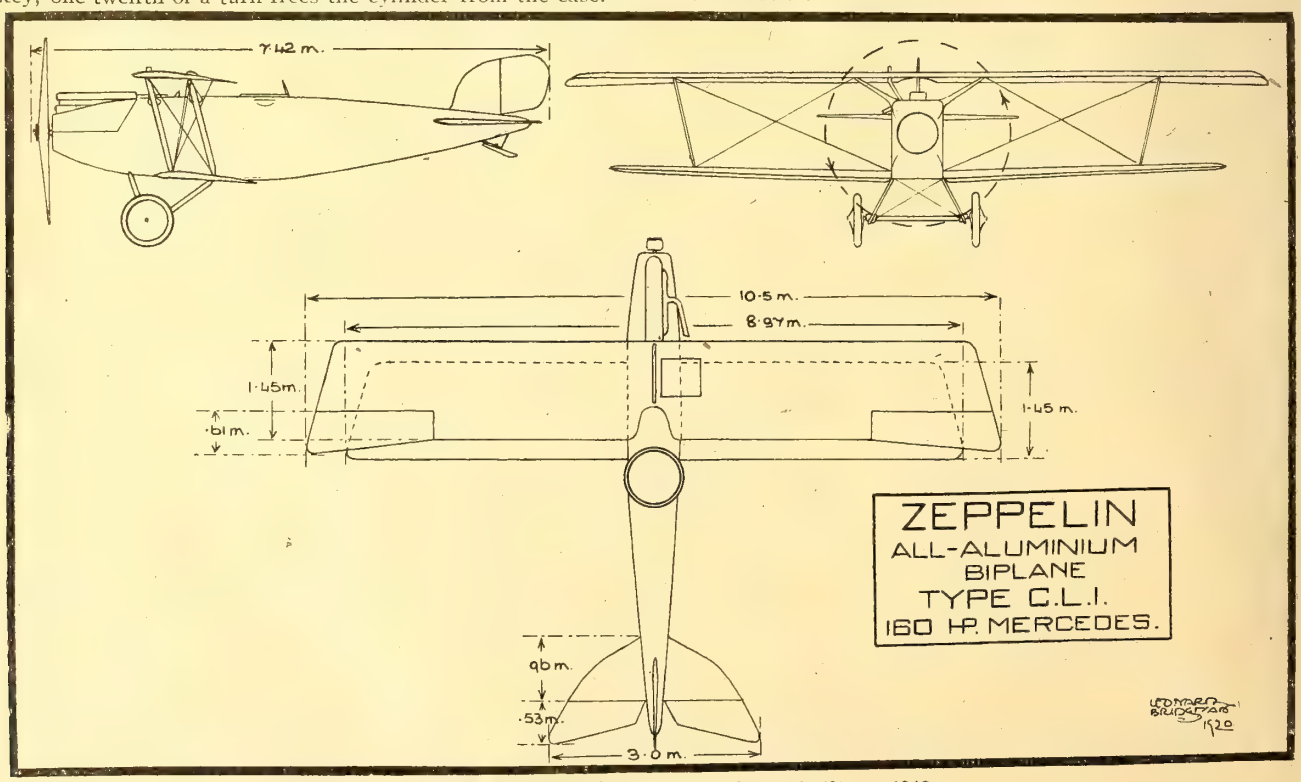
Specifications of the Goebel Engines.

Engine Type	Goc VI	Goc V	Goc II	Goc III
Maximum diameter	660	700	980	1,140
Maximum length	900	965	1,025	1,130
Number of cylinders	7	7	7	9
Mounting of cylinders ...	Flange	Thread	Bayonet	Thread
Bore m.m.	94	105	138	158
Stroke m m.	95	105	150	290
Minimum and Maximum Performance H.P.	30/40	50/65	100/110	200/230
Minimum and Maximum R P.M.	1,150/1,200	1,150/1,200	1,150/1,200	1,150/1,200
Valve gearing	Mechanically operated inlet and exhaust valves.		Automatic inlet valve, mechanically operated exhaust valve.	
Nature of gas supply to the cylinder	Induction pipe.		Through crankshaft and case.	
Diameter of in'et valve ...	34	43	54	54
Diameter of exhaust valve ...	34	43	59	59
Magneto, type and number ...	Bosch	type D.A.	clockwise	
Carburetter	1 Pallas type	1 SB-V-AL	2 Pallas type	2 SBL 70/70
Direction of airscrew	Right	hand	Right	hand
Transmission ratio of crankshaft to magneto, oil pump and tachometer	7 to 4	7 to 4	7 to 4	9 to 4
Pump	Piston type, size I	Piston type, size I	Piston type, size II	Piston type, size II
Lubrication	Force-	feeding of	all bearin	gs
Compression ratio $\frac{V + V_1}{V_1}$ ...	1 to 4.6	1 to 5.2	1 to 4.5	1 to 5.2
Petrol consumption per hour	ab. 20 litres	ab. 30 litres	ab. 50 litres 35 kg. = 350 gr. per h.p. an hour	ab. 80 litres 56 kg. = 280 gr. per h.p. an hour
Oil consumption per hour ..	3.5 litres	5 litres	7 litres 6 3 kg. = 63 gr. per h.p. an hour	9 litres 8 1 kg. = 45 gr. per h.p. an hour
Fuel employed	Benzole o 88 Petrol o 7-0.725	Benzole o.88 Petrol 0.7-0.725	Benzole o.88 Petrol 0.7-0.725	Benzole o.88 Petrol o 7-0.725
Oil employed	Castor	or mineral	Castor	or mineral
Weight including propeller hub, kg.	55	75	123	183

N.A.G.

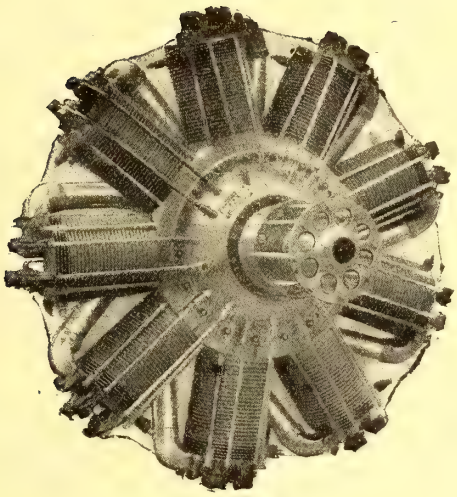
The Nationale Automobil Ges., which is owned by the A.E.G. concern, built first the Wright engine under licence in Germany. Improved and enlarged editions of their own design were used to some extent in early airships, seaplanes and aeroplanes, but aero-engine manufacture was given up before the outbreak of war. When the company's production facilities were required the engine of Herr Conrad, the editor of the technical motor journal *Der Motorwagen,* which he had built in his Deutsche Motorenbau Ges., was taken up.

The engine was of the straightforward German type, a mixture of the Mercédès overhead camshaft type and the Benz outlines otherwise. It was employed to some extent for school work, but not allowed time to gain the pilot's confidence on active service. The manufacture was dropped before the Armistice.



An Early Zeppelin All-Metal Biplane, built in 1918.

GWYNNES' AERO ENGINES



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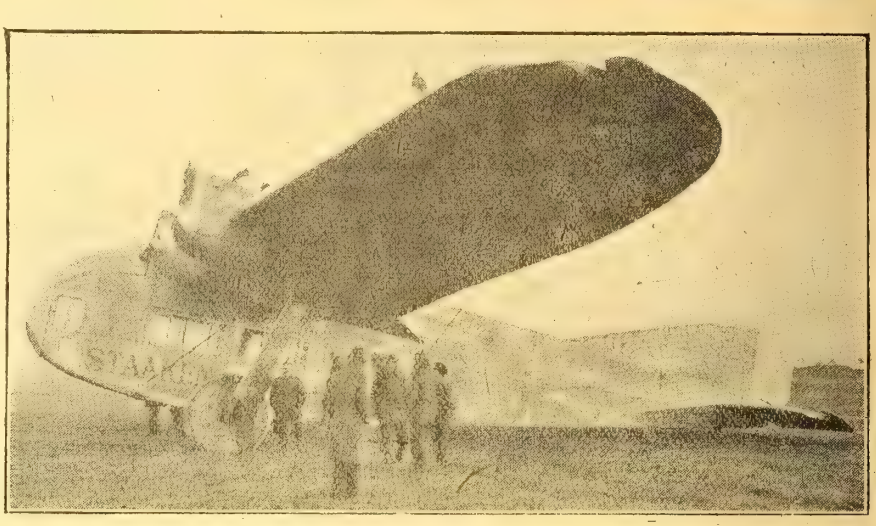
THE ZEPPELIN STAAKEN GIANT MONOPLANE.

The attached photographs show in the completed stage the machine some parts whereof were illustrated in this paper in the issue of May 19th, 1920. The machine is an all-duralumin semi-cantilever monoplane

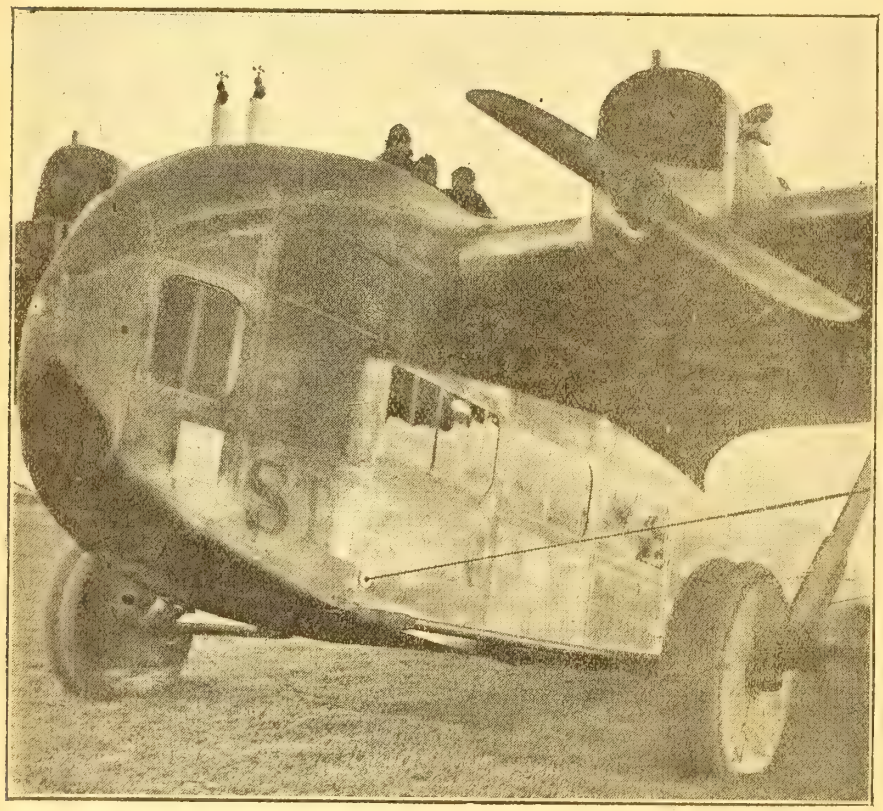
The fuselage, which is built on somewhat similar lines to the usual German three-ply structure, is devoid of longerons, and consists entirely of a riveted up duralumin sheet, kept to shape by duralumin girder bulkheads. The general nature of the structure is evident from the earlier photographs above referred to. The cross-section of this fuselage is sufficient entirely to contain the accommodation for crew and passengers. Seats for 18 of the latter are provided, together with lavatory accommodation, and very ample window space is provided to the cabin.

The pilots' seats are in the top of the fuselage, and open, giving an excellent view.

The wings are built out from specially heavy bulkheads in the fuselage, and are of very deep section—1.2 metres at the root. They are built on duralumin spars and ribs, and the duralumin covering forms an integral part of the wing structure. Into the wings are built four engine nacelles, two on each side, both engines projecting appreciably ahead of the leading edge, and each driving a separate tractor airscrew. In each of these nacelles there is a seat for a mechanic, and these seats may be reached from the body by crawling through a tunnel in the wings. Each engine is cooled by a honeycomb nose radiator.



Half side view of the Zeppelin Staaken Passenger Monoplane.



The Zeppelin Staaken Monoplane, showing pilots' position, undercarriage, and engine nacelles.

The undercarriage is of great simplicity, there being only three struts on each side. Two of these are horizontal, and from the lower corner of the fuselage converge at the wheel axle. The third is a vertical telescopic strut with encased shock-absorbers, running up to the wing at a point between the two engines. Twin side-by-side wheels are fitted on each side of the undercarriage.

Two heavy cables run from the bottom edge of the body to front and rear spars at about two thirds of the half span from the body, and take lift loads. Landing loads are taken solely by the wing framing.

The tail consists of fixed tail and fin plus balanced elevators and rudder. These surfaces are all-duralumin framed and covered, and are pure cantilevers in structure. Ailerons of very small chord, and heavily balanced, are fitted at the wing-tips.

The wing loading is extremely high—80 kg. per sq. metre—or about 16.5 lbs. per sq. ft.—and the weight per h.p. is 8.8 kg.—over 19 lbs. Despite these high figures, the machine is said to take off and to land in quite a short space—250 to 300 metres to take off and 150 metres to pull up. On preliminary trials a speed of 180 k.p.h. (111 m.p.h.) was reached, since increased to 225 k.p.h. (138 m.p.h.) officially measured.

The design of this machine was due to Dept. Ing. Rohrbach, of the Zeppelin works at Staaken, and was carried out in 1919. The construction was mainly carried out during 1920 and tests have

Front view of the Four-engined Zeppelin Staaken Passenger Monoplane. (Four 260-h.p. Maybach Engines).

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October, 1920.

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SUBJECT:— Air Ministry Competitions, 1920.

Gentlemen, Oct 18 RAB

I am commanded by the Air Council to forward, herewith, a draft for £7,500, being the first prize awarded to your Westland Six Seater machine in the Small Aeroplane class in the recent Competitions.

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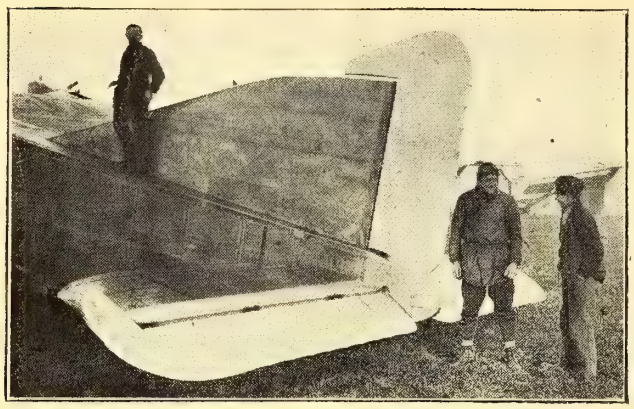


The Tail of the Zeppelin Monoplane.

but recently been made. The use of metal sheet for wing covering in Germany was originated by Professor Junkers in his all-steel monoplane of 1916. The use of duralumin for wing covering, however, was, it is claimed, originated by Dipl. Ing. Dornier, of the Zeppelin Works, Lindau, in the DoD1 single-seater fighter of 1918, a machine somewhat similar to that illustrated on page 904.

The main particulars of the Zeppelin Giant are given in tabular form hereafter.

SPECIFICATION OF THE ZEPPELIN COMMERCIAL MONOPLANE.

Span	31.8 m.	Wing loading,	80 kg. per sq. m.
Length overall	18.20 m.	Power loading,	8.8 kg. per h.p.
Height overall	5.10 m.	Fuel capacity	5½ hr.
Wing area	110 sq. m.	Range	1,100 km.
Engines, 4 260-h.p. Maybach		Maximum speed	225 k.p.h.
Weight empty	5,300 kg.	Landing speed	80-85 k.p.h.
Total load	3,880 kg.		
Total weight loaded, 9,180 kg.			

THE DE PISCHOF AVIONETTE.

Brief particulars of the De Pischof biplane have already been given in THE AEROPLANE, but the following details of construction, for which one is indebted to our esteemed French contemporary *L'Aeronautique*, are of interest. The photograph was kindly sent by M. Roche d'Estrez, of *L'Air*.

It is built entirely of metal, and has a factor of safety of 6.0, with a total weight of but 102 kilogs. This reduced weight, with the high co-efficient of safety, has not been obtained by merely "shrinking" an ordinary aeroplane, the principle adopted by the designer being to reduce the number of working parts to a minimum, at the same time making each component perform as many objects as possible.

Having designed a light machine, the ordinary undercariage was found to be unnecessary, experience having proved that in an avionette the pneumatic tyres absorb practically all shocks, without the necessity of having an axle mounted on rubber shock absorbers. This permits the use, as an axle, of the central section of the front spar of the lower plane, which provides the point of attachment for the lower planes, and for the bracings of the wing cellule, and also acts as the axis for the rudder pedals.

The engine is a two-cylinder horizontally opposed air-cooled 16-h.p. Clerget-Blin. The principal characteristics are as follows :—

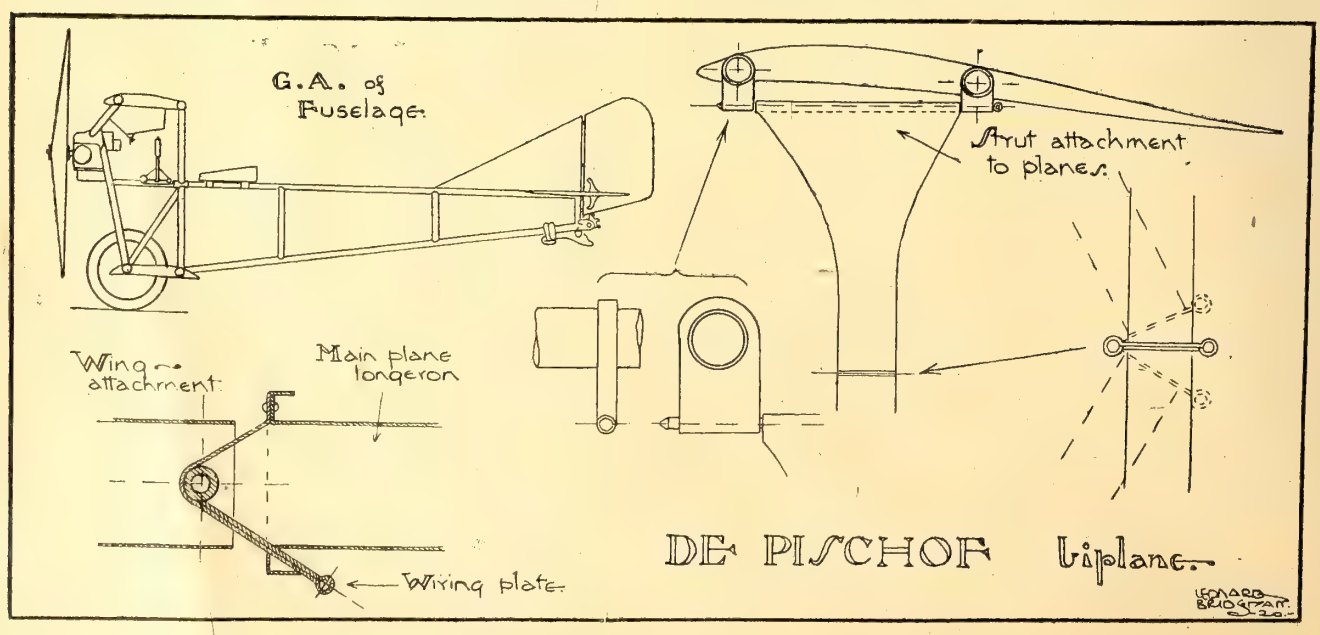
Span, 5.2 m.; Length, 3.5 m.; Height, 1.3 m.; Surface, 7.5 sq. m.; Fuel consumption, 6 litres per hour; Speed, 90-95 km.p.h.; Climb, 1,200 m. in 52 minutes.

In spite of its reduced dimensions and lightness, the machine is extremely stable, and also very controllable.

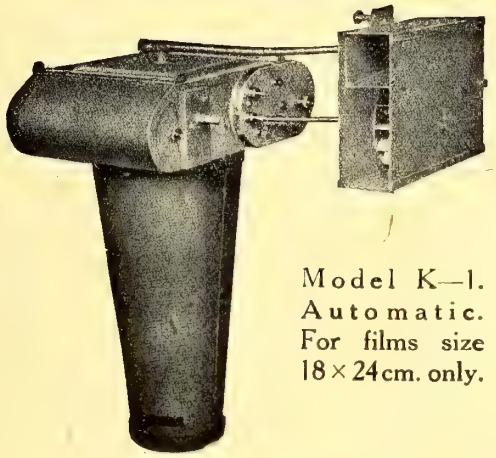
An important detail is the ease with which the machine can be compressed into a small space by means of folding wings. It is only necessary to withdraw four steel bolts to remove the wings complete with all bracing. In addition, the single interplane struts fold in the middle, which, in addition to allowing the width of the machine to be reduced to the width of the fuselage, also allows the wing cellule to be reduced to a depth equal to twice the thickness of the wings. It also allows the assembly of the little aircraft to be very simple, as the wings can be fitted to the fuselage with the bracing slack, the whole being tautened up by straightening the interplane struts and securing by two safety-bolts.

For safety in landing the wheels are placed well forward, the weight on the tail skid when on the ground with pilot in his seat being about 23 kilogs. This load is reduced to 8 kilogs. when the aircrew is in motion.

A Zenith carburetter and a Lumière airscrew 1.5 m. diameter and 0.65 m. pitch are fitted.



Aerial Photography



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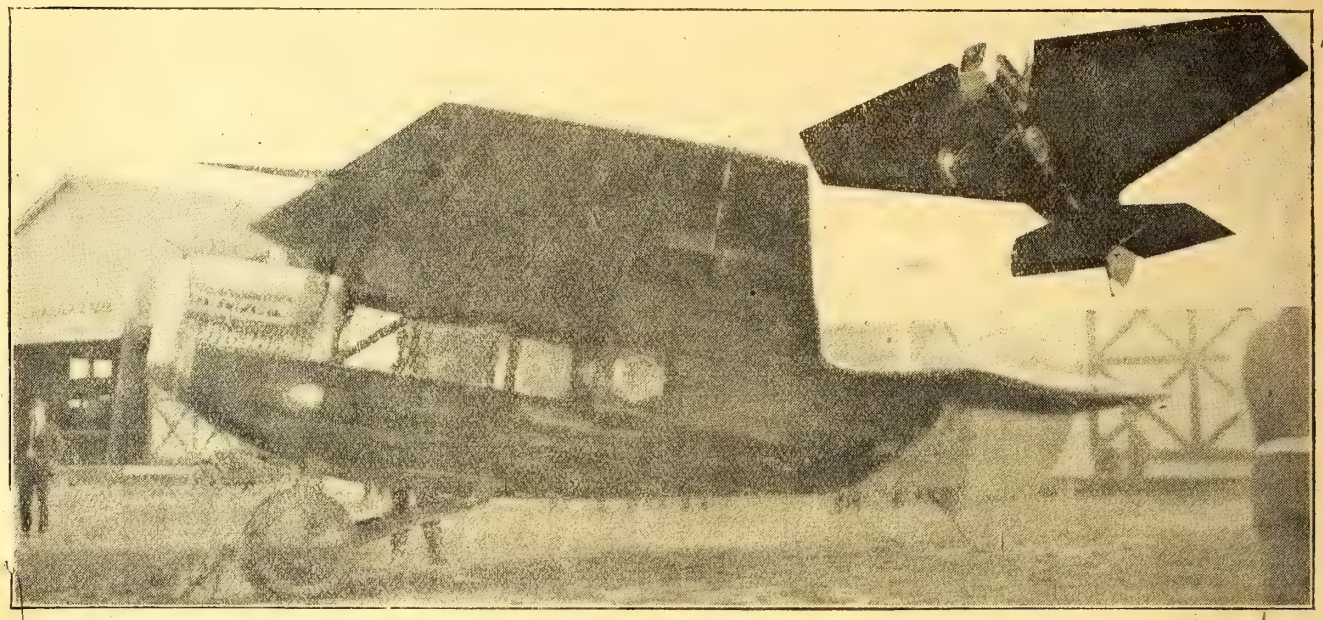
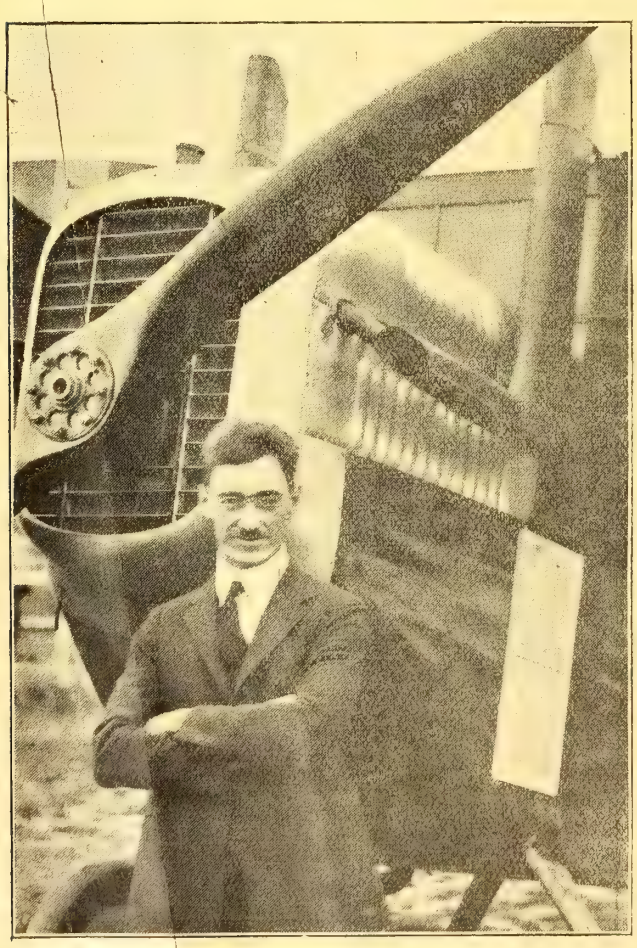
THE STOUT THREE-SEATER MONOPLANE.



The curious-looking machine shown in the accompanying illustration is the product of the Stout Engineering Laboratories of Detroit, U.S.A. The design thereof is due to Mr. W. B. Stout, who has been experimenting with aeroplanes of this general type since early in 1918.

The original experiments which have led to the present machine were carried out under the auspices of the American Government. As may be seen, the machine is of the thick-winged cantilever monoplane type, with a wing of enormous chord at the centre and of very pronounced taper towards the tips.



Mr. W. B. Stout, the designer of the curious Monoplane described above.

It is built entirely of wood, and is veneer-covered throughout, including the wings and tail surfaces. It is stated that test flights recently made at Detroit have given entirely satisfactory results, and that the machine gets off quickly, is stable and controllable, and has quite a good performance.

Except in regard to the wing form, the machine seems fairly normal. The fuselage entirely contains pilot and passenger, who are seated behind the engine. The undercarriage is of the standard vee type, and the usual tail organs are carried. The only noticeable feature is the inverted heavily cambered tail, which suggests that the movement of the centre of pressure over the very large chord requires a lot of compensation.

The general particulars and dimensions are given below.

Specifications of the Stout Three-Seater Monoplane.

Span	36 ft.
Length	22 ft. 6 in.
Mean chord	10 ft.
Total wing area	360 sq. ft.
Body cross-section (max.), 5 ft. 9 in. by 3 ft. 6 in.	
Area—	
Tail plane	40 sq. ft.
Elevators	30 sq. ft.
Rudder	12 sq. ft.
Ailerons	18.5 sq. ft.
Engine	Packard, 200 h.p.
Petrol capacity	60 gall.
Weight empty	1,820 lb.
Weight fully loaded	3,340 lb.
Loading	7.7 lb. per sq. ft.
Weight per h.p.	16.7 lb.
Speed	120 m.p.h.

A TECHNICAL POINT.

Will some kind and knowledgeable person please explain why air-cooled engines suffer less from overheating in hot countries than do water-cooled engines? It is recognised that in Mesopotamia and Palestine, where the highest temperatures have been experienced by the R.A.F., water-cooled engines almost invariably boil their water away, whereas air-cooled engines continue to work. Is it merely that all radiators are bad, or is it impossible to keep a water-cooled engine as cool as an air-cooled one in a hot climate?

[The answer is that water boils at a temperature below that at which an air-cooled engine will continue to function.—Ed.]

A detached flight working with the Army somewhere north of Baghdad, where it is so hot that ice is issued as a daily ration to all ranks, has been suffering from the fact that the water in their radiators boils away after two hours of flying, which of course gives the machines a very small radius of action. The local Army Commander, being worried at the inability of the R.A.F. to carry out long distance work, inquired the reason and was told that it was because of the trouble with the water. Being an eminently practical man, and having, as an officer of the Indian Army, some experience of antidotes to overheating in the human machine, he sent a letter to the Flight Commander offering him a double ration of ice.

Unfortunately he omitted to suggest a method by which ice could be applied satisfactorily to the engine. Possibly some technical officer or engine expert may think of a satisfactory method either of applying ice to water-cooled engines or of keeping them cooled without ice.

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A USEFUL HANDBOOK.

The Erection and Trueing-up of Aeroplanes. By F. W. Halliwell, A.F.R.Ae.S., A.M.I.A.E. "Flight" Library. (The St. Martin's Publishing Co., Ltd., London. Price 5s. net.)

This useful little book, the first volume of the "Flight" Library, is described as a practical treatise on rigging, and merits the description. It is divided into two parts, one dealing with the general principles involved, and a second devoted to examples of the processes involved in trueing up typical machines. The whole is clearly written and illustrated, and can confidently be recommended to all those who desire to study the art of rigging aeroplanes.

SOME AMERICAN EXPERIMENTS.

According to the American *Air Service News Letter* the Aviation General Supply Depot at Middleton, Pennsylvania, have now grafted a Liberty engine onto a Breguet type 14 A.P. machine. This is said to result in a flying speed fully equal to that of a D.H.4 (American version presumably) and a considerably lower landing speed. The machine is said to be very stable laterally, but totally insensitive to aileron control. One is left in doubt as to whether the Liberty engine is responsible for (a) the stability, and/or (b) the insensitiveness, and whether (b) was necessary for (a) to show itself when the machine was piloted by an American Service pilot.

Apropos the habits of the latter, the same journal records certain minor incidents at Bolling Field aerodrome during the week beginning April 19th. A certain St. George Wise—"one of the most capable fliers at Bolling Field"—made a forced landing on a Fokker. Mechanics overhauled the engine and he took off again and lost his engine again at 1,000 ft., and landed again. Engine again overhauled, he took off, lost his engine at 50 ft., and crashed. On Thursday the same officer, piloting an Avro, lost his engine at 150 ft., spun to the ground, and was the occasion of a record run to the hospital. On the same day a Lieut.-Colonel Christie, of the Aeronautical Board, attempted to land a D.H.4 at that aerodrome. It is stated that he struck a soft spot on the ground at full flying speed, with the result that the machine turned over. This sounds very like unto the habits of certain British Air Force officers of similar exalted rank—but evidently the "joss" does not hold in America, for Colonel Christie was badly cut about the face, and it is feared that his beauty of feature will be impaired. Earlier in the same day a D.H. caught fire in the air—but as the machine appears to have been in the control of a capable pilot (Lieut. McGinnis), he and his passenger side slipped to earth, landed, and escaped.

A further note in this same interesting periodical indicates that certain of the lessons of such minor accidents are sinking into the mind of America, for quite a long paragraph is devoted to the fact that safety in landing is an important factor in flying. This demonstrates clearly that it is hoped in time to develop undercarriages capable of looking after American landing habits.

PIONEERING.

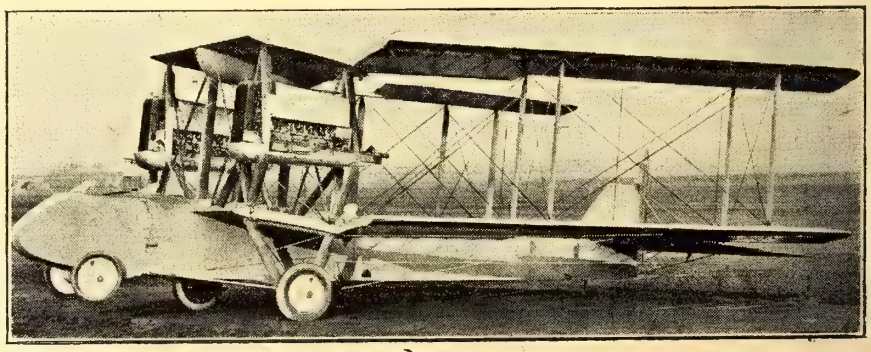
The following letter has been received, together with the accompanying photagraph :—

Stag Lane Aerodrome,
Edgware, Middlesex.
November 23rd, 1920.

Sir,—In the issue of The Aeroplane of November 17th, the Fairey Aviation Co., Ltd., published particulars of a twin-engined biplane constructed by them in 1916, and further suggested that the pioneers of multiple-engined aeroplanes in this country should make their work known.

We heartily endorse this suggestion and therefore give the following particulars of the D.H.3 which was designed nearly six years ago by Capt Geoffrey de Havilland.

The D.H.3, which was a twin-engined folding-wing biplane, was flying in April, 1916. It was fitted with two 120-h.p. Beardmore engines, or 240 h.p. in all, and carrying a useful load, including petrol, of 1,800 lb., the speed was 95 miles an hour. The total weight, fully loaded, was 5,800 lb.



The D.H.3 (Two 120-h.p. Beardmores) designed by Capt. de Havilland in 1915.

Can any designer of multiple-engined aeroplanes boast of more successful "pioneering"?

(Signed) The de Havilland Aircraft Co., Ltd.

A FINE RECORD.

That excellent engine the Siddeley "Puma" is steadily increasing for itself the high reputation which it has so long deserved. The majority of the D.H.9s which have done such splendid service during the last twelve months on the cross-Channel lines in the hands of the pilots of Aircraft Transport and Travel, Ltd., and Handley Page Transport, Ltd., have had Siddeley "Pumas." Pilots of the Royal Air Force in India, Mesopotamia, Palestine and Egypt have used "Puma"-engined D.H.9s with continuous success. In fact it was in the East that the "Puma" first became really popular with R.A.F. pilots after many types of engines had given considerable trouble owing to the intense heat.

The remarkable flight made by Mr. MacIntosh, of Handley Page Transport, Ltd., from Paris to Lympne against the hurricane on December 6th, when no sea-going vehicle dared to face the gale at sea, was made with a Siddeley "Puma."

A namesake of Mr. MacIntosh, with Mr. Parer, made the first single-engined voyage to Australia with a "Puma," this being one of the most wonderful aerial journeys the world has yet seen.

Also it is well to point out that the longest *bona-fide* commercial flight yet made—namely, Mr. Perry's flight from London to Jassy in Roumania and back—was also made with a "Puma." It will be remembered that Mr. Perry left London on September 12th, was held up for two days at Belgrade by the Servian authorities, and arrived at Bukarest on September 16th, his actual flying time being only 16 hours. His passenger, Mr. R. Wright, managing director of Nasmyth, Wilson and Co., was so pleased with the flight that he kept the machine in Roumania till he had transacted his business.

In one day he flew with Mr. Perry from Bukarest to Jassy and back and transacted his business in Jassy. The single journey to Jassy by rail from Bukarest takes 24 hours with luck, and may take 36.

The return journey was made in three stages, Bukarest to Vienna the first day, Vienna to Strasburg the second day, and Strasburg to London the third day, each flight being made non-stop. The pilot and passenger thus had plenty of time in which to visit places of interest in Vienna and Strasburg.

With such performances to its credit it is not surprising that the Siddeley "Puma" is becoming increasingly popular with buyers of aeroplanes all over the world. Consequently, it is natural that one should hear that the Aircraft Disposals Co., Ltd., finds quite a demand for machines fitted with "Puma" engines and for the engines themselves.

For commercial work it is found that the low-compression "Puma" is more satisfactory than the high-compression type, and official notices have been issued by the Department of Civil Aviation notifying the fact that Air Worthiness Certificates will not be given to commercial machines fitted with the high-compression "Puma." Foreign Governments equipping their air forces will probably have different views. In either case it has been proved that, whether with high compression or low compression, the Siddeley "Puma" is undoubtedly one of the most satisfactory aero-engines in the world.

ALUMINIUM.

The British Aluminium Co., Ltd., 109, Queen Victoria Street, London, E.C.4, announce that they are increasing their output of aluminium bodywork for cars. The main advantage of this type of body is lightness, which means reduced running costs, lower fuel consumption, and less wear on tyres. It is, moreover, easy to restore the shape in case of a collision or the type of crash that cars "are heir to."

Though of course commercial aeroplanes are not so liable to accidents as are cars, aluminium is much used on the former. During the war the British Aluminium Co. was responsible for a goodly share of the excellent aluminium work found on Service aircraft.

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It is uniform in quality, and can be relied upon to be free from hard spots and internal and surface defects.

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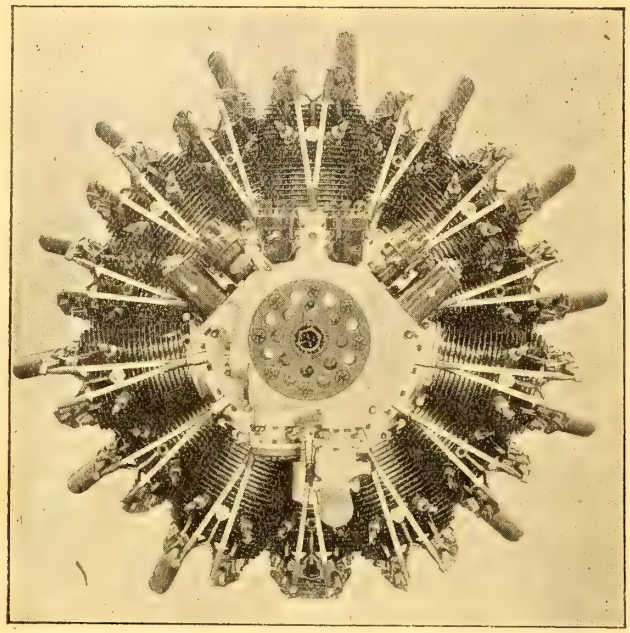

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Two-Seater
Engine : 100 h.p. "MONO"

Armstrong Whitworth
F.K. 8
Engine : 160 h.p. Beardmore

Bristol Fighter
Type F.2
Engine: 300 h.p. Hispano

De Havilland Two-Seater
D.H.9
Engine : 240 h.p. S ddeley Puma

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THE SUPPLEMENTARY ESTIMATES FOR THE AIR MINISTRY.

A MINISTRY OF MUNITIONS RAMP.

On Dec. 8th a White Paper was issued setting forth Supplementary Estimates for the Air Ministry amounting to £1,935,300 for the year ending March 31st, 1921.

There was the usual outcry from certain newspapers and certain Members of Parliament about reckless expenditure and inflated armaments, but, owing to the obscure way in which the White Paper had been arranged, few people seem to have comprehended the fact that the authorities at the Air House had in fact effected notable economies and that the Supplementary Estimates have been necessitated by a financial ramp on the part of the Ministry of Munitions such as is quite worthy of a department organised by Mr. Lloyd George.

The sum demanded is, as stated above, £1,935,300. The Air Ministry has effected a saving during the year of £2,050,800, having spent that much less than the £21,000,000 provided in the estimates originally presented. But the Ministry of Munitions, being composed of business-men and not of regular servants of the King, has foisted onto the Air Ministry its own debts for "liquidation of war-time contracts" to the tune of £3,255,200.

This has swallowed up the Air Ministry's savings and left it in debt, though actually the debt was incurred by the Ministry of Munitions, that amazingly extravagant and hopelessly inefficient department which was responsible for the supply of aircraft matériel during the latter part of the war, and delivered the smallest amount of goods for the largest amount of money with all the success of the most blatant war-profiteer. Which was only natural, seeing that so many of its officials were war-profiteers by trade and Government officials as a side-line.

AIR MINISTRY ECONOMIES.

It is particularly interesting to note that, although the Air Ministry has effected economies amounting to £2,050,800, it has provided for the establishment of five additional squadrons (£267,000), new works services (£141,500), and outfit allowances for officers (£37,300). Therefore one feels that a vote of thanks to the Air Council should be passed by the House of Commons for being the only department of the present Government which has ever economised.

It is worthy of note that the actual saving of money by not spending it—as distinct from saving it by buying in the best market—has been done by the Department of Civil Aviation and by the Department of Supply and Research. These savings, or surpluses, are divided as follows :—

Technical and warlike stores, £506,500.
Experimental and research services, £805,700.
Civil aviation, £514,200.

That is to say, Civil Aviation and Research, the two branches on which the progress of British aviation and the maintenance of our much-vaunted Command of the Air primarily depend, have been robbed of £1,319,900 in order to pay the debts of Mr. Lloyd George's pet extravagance, the Ministry of Munitions. And even Technical and warlike stores, on which the present efficiency of our aviators on active service depends, have been robbed of over half a million pounds for the same purpose. If ever there were false economies, surely these are splendid specimens.

WHAT IS.

Naturally, as a taxpayer, one rejoices that the Air Ministry should be of so frugal a mind, and one would be more kindly disposed towards these economies if the taxpayer benefited more by them. But under the circumstances one regrets that the money was not spent as originally intended.

Consider the difference it would have made to the impoverished Aircraft Industry if that half-million had been spent on "Technical and warlike stores." As it is, barring Fairey deck-flying machines and a few slightly modified Bristol Fighters, the R.A.F. has ordered no new aeroplanes since the war. All our little wars in India, Mesopotamia, Asia Minor, Palestine and Ireland have been and are being carried on with obsolete machines designed in 1916 or thereabouts.

A few new engines of experimental types are on order, and perhaps a few have been delivered. But, as with their aeroplanes, the R.A.F. is carrying on war with engines which ought to have been obsolete at least a year ago if development work had been done as it should have been on the new engines which were designed just about the end of the war. For example, there were the big new Siddeleys, Napiers and Rolls-Royces, not to mention the Siddeley radial and the Bristol "Jupiter" radial, which should long ago have replaced the clumsy and extravagant rotaries of all types.

AND WHAT MIGHT HAVE BEEN.

Consider also what might have been done for Civil Aviation if General Syke's department had spent its half-million, instead of saving £36,000 on wages, £73,900 on stores, £140,000 on technical equipment, £258,000 on works, buildings and land, and £7,000 on meteorological services. The quarter of a million saved on works and lands alone would have made a handsome grant to the various air lines "for services rendered," and would have set them up by now as sound commercial concerns.

A very little of the £36,000 saved on "Wages" would have provided a very much more efficient personnel in the department itself and at certain aerodromes. It might even have paid for a few motor-cyclists to convey mails promptly between the terminal aerodromes at London and Paris and the respective General Post Offices, so that there would not be those unnecessary delays which make the Air Post Service slower over all than the rail and boat services—except when the aeroplanes get across the Channel and the boats fail to do so.

Possibly some of the £140,000 saved on "Technical equipment" might have paid for the motor-cycles and side-cars for these messengers to ride. And there are many other ways in which the money could have been usefully expended.

Altogether, it seems that by saving the money voted, which it had a perfect right to spend, the Department of Civil Aviation has come perilously near to ruining Civil Aviation.

LOST OPPORTUNITIES.

Similarly, saving £805,700 on "Experimental and Research Services" has probably retarded the progress of aeronautical knowledge by at least twelve months, and possibly by two or three years. Supposing, for example, this Department had gone round to about a dozen intelligent firms which were known to possess clever designers and had ordered from each £20,000 worth of experimental machines with various characteristics about which further knowledge is needed. That alone would have been enough to keep together a supply of designers and draughtsmen adequate to do any work required in aircraft design in case of a sudden war, and it would have enabled a number of clever young men to develop their aircraft ideas, instead of turning their ability to designing motor-cars and bedsteads and such things.

Why has not a few tens of thousands of this vast sum (saved for no good purpose) been spent on having machines with new types of wings built by various firms? Over a year ago Capt. Sayers set forth clearly in this paper the possible benefits to be derived from high-lift wings. Has Air Vice-Marshal Ellington's department done anything whatever to investigate those possibilities, or is he himself too wrapped up in apochryphal steam-turbines to be interested in such practical things as efficient wings?

Has this Department spent any of its money in ordering experimental work of this kind to be done by any of various firms which are competent to do it? Not so far as one's own knowledge goes.

Yet impoverished Germany has been developing high-lift cantilever wings, of the Junkers and Fokker types, and learning their value to Civil Aviation, despite the vagaries of the comic Inter-Allied Aeronautical Commission, while Air Vice-Marshal Ellington has been saving over three-quarters of a million pounds which, if judiciously spent among intelligent firms, would not only have kept the British Aircraft Industry on a sound financial footing, but would have put us far ahead of Germany in our knowledge of wing values.

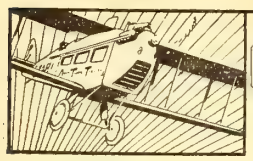
Instead of experiments with the Handley Page wing progressing slowly (which is as fast as any one shop at a time can progress) in the Handley Page Co.'s works, and the experiments with the Alula wing progressing slowly in the Blackburn works, half a dozen firms at least ought to be at work on these experiments, each on its own lines so far as detail design is concerned. There is no hindrance so far as the patent is concerned, for Mr. Handley Page is willing to let any firm build experimental wings without any royalty, and only asks a very small royalty on series-built machines with these wings. Doubtless Mr. Holle will be equally reasonable.

Therefore, why does not Air Vice-Marshal Ellington's department spend some of its ill-gotten savings on "experimental and research services," instead of playing the miser and retarding aeronautical progress?

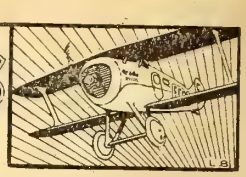
HOWBEIT.

But perhaps, after all, it is for the best. When any industry in this country has been a success it has become so in spite of Government departments. One cannot recollect any that has been helped to success by the Government as such, though, as in aircraft work, here and there a few enlightened officials have done much to help individual people or firms in various industries.

Therefore perhaps, instead of railing at these departments of the Air Ministry for saving money instead of helping the progress of aviation, we should rather thank them for relieving the burden of our taxation to that extent and for starving the Aircraft Industry so that the weak may die and only those strong in faith and in finance may survive. Thus the Departments are helping Nature to administer her first law, the survival of the fittest.—C. G. G.



COMMERCIAL AERONAUTICS
AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.
OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIRMEN.

No. 132, Dec. 1st, 1920.—Aerodrome List Amendments (374357/20). One Aerodrome added and three deleted from list C (b).

No. 133, Dec. 3rd, 1920.—Denmark: Flying Over Danish Waters.

No. 134, Dec. 7th, 1920.—Croydon Aerodrome: Signal experiments. Pilots warned against mistaking the experiments for legitimate aerodrome signals.

No. 135, Dec. 9th, 1920.—Aerodrome List Amendments (238786/20): One aerodrome deleted from List C.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

DECEMBER 6th:

A.T.T., DH16, G-EAPT, London-Paris, 12.42-15.00, G.&M., Nil, Tebbit.
M.A., Breguet, F-CMAI, London-Paris, 12.57-15.55, G., 1, Martel.
A.T.T., DH9, G-EAPL, Paris-London, —12.20, Nil, Nil, Carter.
A.T.T., DH16, G-EALU, Paris-London, 12.35-15.15, G., 3, Reeves.
G.E.A., "Goliath," F-GEAD, Paris-London, 12.20-15.16, G., Nil, Labouchere & 1.

DECEMBER 7th:

NIL.

DECEMBER 8th:

NIL.

DECEMBER 9th:

NIL.

DECEMBER 10th:

M.A., Breguet, F-CMAB, Paris-London, 12.40-09.40, 11/12/20, G., Nil, Le Men.
M.A., Breguet, F-CMAG, Paris-London, 12.50-12.15, 12/12/20, G., Nil, Challoux.
A.T.T., DH16, G-EAPT, Paris-London, 10.30, Lympne, G.&M., Nil, Tebbit.

DECEMBER 11th:

M.A., Breguet, F-CMAC, Paris-London, 12.47-11.45, 12/12/20, G.&M., Nil, Martel.

DECEMBER 12th:

M.A., Spad, F-CMAY, London-Paris, 10.54-13.05, Nil, Nil, Le Sec.
M.A., Breguet, F-CMAB, London-Paris, 10.55-13.40, Nil, Nil, Le Men.
A.T.T., DH18, G-EAUF, London-Paris, 13.47-16.14, G., 3, Armstrong.
G.E.A., "Goliath," F-GEAD, London-St. Inglevert, 15.00-16.18, G., 1, Labouchere & 1.
H.P.T., DH4, G-EAVL, Brussels-London, —13.28, G., 1, Foot.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

DECEMBER 6th:

H.P.T., HP, G-EAMA, Paris-London, 12.45-16.20, G., 5, Bager & 1.

DECEMBER 7th:

H.P.T., HP, G-EAMA, London-Paris, 12.00-15.25, G., 7, McIntosh & 1.
H.P.T., DH4a, G-EAVL, London-Brussels, 13.23-15.45, G.&M., 2, Foot.
H.P.T., DH9, G-EAUC, London-Brussels, 12.56-12.05 (8th), G., 1, Beal.

DECEMBER 8th:

NIL.

DECEMBER 9th:

NIL.

DECEMBER 10th:

S.N.E.T.A., DH4, O-BATO, London-Brussels, 12.30—, G.&M., 1, Fowler.
H.P.T., DH9, G-EATA, Brussels-London, 12.40-15.05, G., Nil, Hope.
H.P.T., HP, G-EAMA, Paris-London, 12.47-16.15, G., 6, McIntosh & 1.

DECEMBER 11th:

H.P.T., HP, G-EAMA, London-Paris, 11.50—, G., 2, McIntosh & 1.

DECEMBER 12th:

NIL.

Air Port Statistics.

CONTINENTAL

MACHINES:	Croydon	14	Cricklewood	8	Total 22
PERSONNEL.—Passengers:	Croydon	9	Cricklewood	24	Total 33
Crews:	Croydon	16	Cricklewood	12	Total 28
				Grand	Total 61

Inland Flying at Croydon.

Dec 6th-9th.—Nil.
Dec. 10th.—A.T.T., Avro, 1 test (Robins).
Dec. 11th.—I.A.L., "Vimy," from Brooklands (Cockerell).
Dec. 12th.—L.A.S., DH6, from Leatherhead, return. 12 joy-rides (Muir). I.A.L., "Vimy," 3 joy-rides (Barnard)

Inland Flying at Cricklewood.

Dec. 6th.—Nil.
Dec. 7th.—H.P.T., DH9 from Lympne (Olley).
Dec. 8th and 9th.—Nil.
Dec. 10th.—H.P.T., DH9 to Coventry return (Olley); O/400 from Lympne (Jones).
Dec. 11th and 12th.—Nil.

The London Terminal Aerodrome.

The weather during the week has been appalling, rain, gales, and, finally, snow. It is a wonder that any machines have been able to get through at all.

On Sunday one noted several of Col. Frank Searle's motor omnibuses stuck fast on West Hill, by the Crystal Palace, but on the same day his aeroplane was getting through all right on the Paris route, which only shows the advantages of air travel, as anyone who has had the misfortune to travel lately on trains, tubes or 'buses will endorse heartily.

The Instone "Vimy" arrived at Croydon on Saturday from Brooklands piloted by Messrs. Cockerell and Broome. They had a very bad trip and visibility was about seven inches.

On Sunday the "Vimy" was joy-riding in the snow, as was the D.H.6, of the Leatherhead Aviation Service

On Wednesday there was a magnificent firework display. This was done for the purpose of choosing signal lights for guiding aircraft. There were two enormous rockets, among other things, which rather reminded one of the enormous bell in Drury Lane Pantomime, which, when rung, used to emit a very faint tinkle. The first rocket was a "dud" and the other emitted one small faint star. The biggest success of the afternoon were the "moth-balls," which were a species of bomb fired from a mortar as at the Crystal Palace. Mr. Curtis's lighthouse formed an excellent grandstand for the entertainment.—G. D.

The Cricklewood Accident.

At the moment of going to press news is to hand of an accident to an O/400 Handley Page leaving Cricklewood for Paris on Dec. 14th. It appears to have run into a tree and caught fire on hitting the ground, four occupants being killed. The pilot was Mr. Bager. This is only the second fatal accident on the cross-Channel air lines since civil aviation began.

Mr. McIntosh Again.

Mr. R. M. McIntosh has this week advanced a step farther forward in his war against the weather. On Monday, Dec. 13th, he left Paris for London in a Handley Page O/400 with four passengers (or what Mr. Monty Fenn insists on calling "passagerios" owing to his having heard of Italy) and a heavy load of freight. It appears that he ran through a snowstorm to Abbeville, which he there "swapped" for fog, taking back the snowstorm over the Channel. The snowstorm he enjoyed the remainder of the way, finding Cricklewood by directional wireless.

It seems that it is about time the weather threw in its hand against Mr. McIntosh and stopped wasting its time in this way, as Mr. McIntosh is bound to get his own way in the end. Mr. McIntosh is, as his name might suggest to the more observant, a Scotsman.—G. D.

London to Birmingham.

Special flights, for passengers only, to Birmingham have been arranged for this week only until the 18th instant inclusive.

Handley Page Transport aeroplanes will leave Cricklewood Aerodrome for Birmingham every day at 12 o'clock, weather

R.A.F. Great Coat
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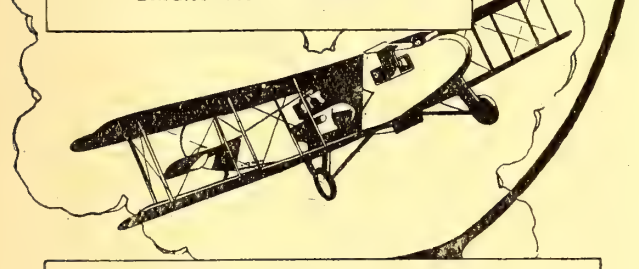

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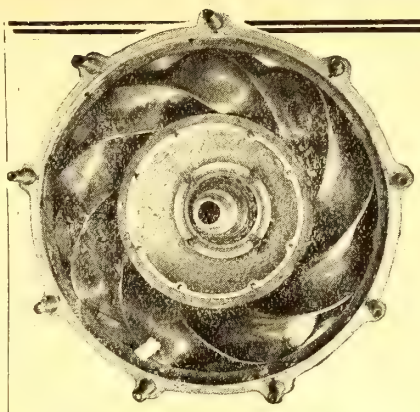
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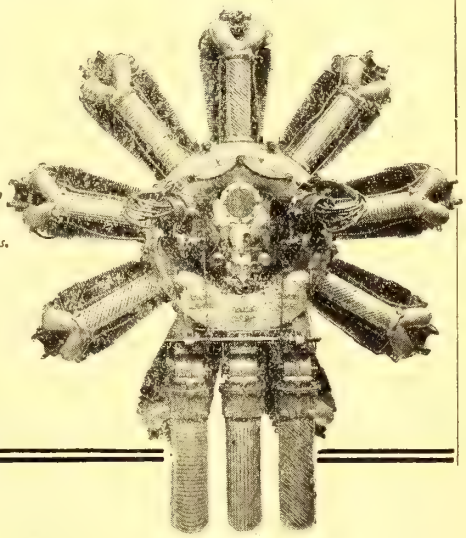
Rear View Showing Carburetters.

permitting. Fare, £2 10s. each; free luggage, 30 lb.; excess luggage, 6d. per lb.

Free motor car facilities will not be offered at either end and return flights cannot be booked.

It is understood that Handley Page, Ltd., are delivering a number of "disposal" aeroplanes (D.H.4s and D.H.9s) to the Aircraft Disposals Co.'s aerodrome at Castle Bromwich, and have adopted this simple and, one hopes, successful method of paying for petrol and oil, and the return railway fares of pilots.

Mishap on the Beardmore Air Line.

On Sunday, Dec. 12th, Capt. Ward and his mechanic had a mishap in the Portholme Meadow Aerodrome, Huntingdon. They left Renfrew on Thursday, Dec. 9th, on a W.B.2, and encountered thick fog on the way which compelled them to follow the Eastern route. Eventually they landed at Grantham with a broken exhaust valve. They restarted on Sunday with the intention of making Croydon, but appear to have met a snowstorm at Huntingdon. In endeavouring to land they crashed. Capt. Ward sustained a cut on the nose, and both he and the mechanic were badly shaken. No details are to hand of how the accident actually occurred, or whether either of the occupants were really badly hurt. On Friday last Capt. Ward remarked that he thought the Glasgow-London air route was one of the worst, as regards weather, now in operation.—G. D.

Brooklands.

A number of Armstrong-Whitworth F.K.8s have been removed from Brooklands in private motor lorries during the week, the fuselages being trailed behind on their own wheels. These machines have been stored in the sheds formerly occupied by the R.A.F.

The Vickers "Vim" instructional machine has been flying again this week. It is not a very pretty-looking machine, but appears to fly well. A prominent feature is the large tail fin which is placed above the rudder.—J. F. S.

Northwich.

On Monday, Dec. 6th, the Berkshire Aviation Co. began a ten days' aviation meeting at Northwich from a site off Vicarage Road. In spite of fogs and the cold weather, many passengers have been carried, and on Sunday, Dec. 12th, flying was carried out during a driving snowstorm, the machine being lost to sight immediately it left the ground.

Free flights are being given in connection with the *Northwich Chronicle*, and much interest is being shown in the flying—the first since the late Mr. Gustav Hamel was there before the War.

Southport.

On Sunday, December 5th, Messrs. Holmes, Taylor and Robinson alighted on the sands by the Victoria Pier at Southport. They flew over from Alexandra Park Aerodrome, Manchester, for lunch. The journey of 40 miles occupied only 30 minutes, and their Avro biplane, aptly named "Duzopit," was much admired.

FOREIGN INTELLIGENCE.

UNITED STATES OF AMERICA.

The Pulitzer Trophy Race.

The first race for the Pulitzer Trophy took place over a triangular course, Mitchel Field, Mineola-Wantagh-Babylon, on Long Island on Thanksgiving Day, Nov. 25th, 1920, under the rules of the F.A.I. and the Aero Club of America.

The contest was divided into six classes, five of which were competing for a prize awarded to the first machine home of each class, in addition to the Pulitzer Trophy, awarded for the machine, irrespective of class, completing the distance in the shortest elapsed time.

The race was started in seven groups, the first, competing for the Contest Committee Invitation Prize, the second and third for the De Havilland Prize, the fourth for the Vought Prize, and the fifth for the S.E.5 Prize. The sixth and seventh groups had no particular prize, other than the Pulitzer Trophy, for which to compete.

The entries were made up of the following machines:—

1st Group: 2 Thomas-Morse (300-h.p. Wright-Hispano); 2 Orenco (300-h.p. Wright); 1 Fokker (300-h.p. Packard); 1 Loening monoplane (300-h.p. Wright); and 1 Sopwith Dolphin (300-h.p. Wright).

2nd Group: 9 D.H.4Bs (400-h.p. Liberty).

3rd Group: 8 D.H.4Bs (400-h.p. Liberty).

4th Group: 6 Vought V.E.7s (180-h.p. Wright).

5th Group: 5 S.E.5s (180-h.p. Wright).

6th Group: 3 Ansaldo (220-h.p. S.P.A.); 2 Loening (300-h.p. Wright); 1 Morane-Saulnier (110-h.p. Le Rhône)

7th Group: 2 Curtiss-Kirkham triplanes (450-h.p. Curtiss-Kirkham); 1 Verville, V.C.P. (600-h.p. Packard).

One extra entry, an army ambulance D.H.4, painted a cream colour with a red cross on its side, elicited the observation that it looked like a Borden's Milk entry.

All the entries, barring the three Ansaldos and the Morane-Saulnier, were service entries, 15 Navy and 26 Army.

Something like 40,000 people witnessed the race of the 34 machines that eventually lined up for the start, and as has been seen before with some large aviation gatherings, became out of hand. They surged round the winning machine on its landing, breaking through the cordon of military police, whose brandished revolvers had not the slightest effect, thus endangering the lives of pilots of other machines, as well as their own less important existence.

Two machines were damaged before the start of the race, caused by an Orenco biplane landing from a practice flight being baulked by a Loening monoplane, resulting in the pilot of the Orenco losing three teeth, while a fair amount of damage was caused to both machines.

Of the machines that failed to finish one Thomas-Morse scout, two S.E.5s, one D.H.4, one Curtiss triplane, and one Vought V.E.7 experienced engine trouble, while one S.V.A. was disqualified for cutting corners.

The official elapsed time for the first six machines home in the Pulitzer Trophy race are:—

1. Lieut. C. C. Mosley, U.S. Army, Verville (600-h.p. Packard), 44 mins. 29.57 secs.;
2. Capt. H. E. Hartney, U.S. Army, Thomas-Morse (300-h.p. Wright), 47 mins. 00.03 secs;
3. Albert Acosta (civilian), Ansaldo (220-h.p. S.P.A.), 51 min. 57.62 secs.;
4. Lieut. St. C. Street, U.S. Army, Orenco (300-h.p. Wright), 52 mins. 57.02 secs.;
5. Lieut. A. Laverents, U.S. Navy, Vought V.E.7 (180-h.p. Wright), 53 mins. 39.19 sec.;
6. Lieut. J. P. Roulot, U.S. Army, DH.4 (400-h.p. Liberty), 56 mins. 06.58 secs.

In addition to the Pulitzer Trophy won by Lieut. C. C. Mosley, Capt. H. E. Hartney won the Contest Committee Prize, Lieut. J. P. Roullot the D.H. Prize, Lieut. A. Laverents the Vought and Capt. M. Kirby the S.E.5 Prize.

Considerable credit is evidently due to Mr. Ralph Pulitzer for putting up the trophy for annual competition, and also to the *New York World* for its enterprize in making the event possible.

Secretary-of-the-Navy Daniels, in a statement made after the race, discloses the fact that he is highly pleased that there was no serious accident, which, he said, "in itself shows that American planes are coming to the front with rapid strides." One would have thought that Secretary Daniels might have made a remark more complimentary to American aviation. One hopes that he did not expect a serious accident.

The improved performances of the "Liberty" engine, which has proved itself in the last year or so to be one of the world's best engines, might have been mentioned by the Secretary of the Navy, instead of dropping the polite brick given above.—L. B.

NAVAL AND MILITARY AERONAUTICS.

The Annual Dinner of No. 6 Wing, R.N.A.S.

At the Connaught Rooms on Wednesday, Dec. 8th, was held the second of the annual dinners of the late No. 6 Wing, R.N.A.S. Forty-three of the members who were with the wing in Italy attended, also Adm. Mark-Kerr and Adm. Murray Sueter, under whose auspices the wing was started. Major J. Morrison presided, a fact which assured the success of the dinner from the first, and after "The King," Wing Comdr. Beuttler proposed the health of "Absent Members," recalling to mind those who had fallen, as well as those who were unable to attend. Speeches on the early days of Naval flying and on the formation of the wing were made by Adm. Mark-Kerr and Adm. Murray Sueter, who were followed by others, notable among whom were Wing Comdr. Cortis Stamford, Sqdn. Ldr. Conway Pulford, and Sqdn. Ldr. W. H. Mackenzie. Vice-Adm. Kelly sent a message of regret for his inability to attend and congratulations and remembrances to members of the wing, which was unfortunately received too late to announce. The third dinner of the series is to be held in December of next year.

No. 24 Squadron.

Reunion dinner for officers will be held in London on Saturday, Feb. 12th. Tickets, £1, excluding wines and smokes (except port for toasts) from Capt. V. A. H. Robeson, The Abbey Cottage, Tewkesbury, Glos.

"55" Again!

The members of 55 Squadron Association heartily congratulate E. F. Van der Riet (Trinity College, Oxford) on his Rugger "blue." There was solid satisfaction in seeing an ex-member of "55" playing for Oxford University at Queen's Club on the 7th inst. There were many ex-"fifty-fivers" present on that occasion to see him play, and the general remark was "Well done, Tubby!"

AIRCRAFT IN PARLIAMENT

On Dec. 9th, Mr. CHAMBERLAIN, replying to Mr. Lambert's motion on the adjournment that the expenditure for 1921-22 be limited to £208,000,000, said:—

"*Air Expenditure.*—The utmost economy will be enforced in the administration of the air programme, and the position and function of the Air Force will be examined in relation to the Army and the Navy."

Mr. CLYNES, in the course of his speech, referring to the Navy, Army and the Air Force, said:—

"All these big spending non-productive Departments are the Departments to which Ministers should turn their attention; and they can only effectively turn their attention to them when more has been done in this country and in other parts of the world to create that certainty of world peace that will drive all these wasteful implements of war completely out of our minds."

THE ROYAL AERONAUTICAL SOCIETY.

LECTURES.

Lieut.-Colonel H. T. Tizard, A.F.C., Fellow, will take the chair at the next meeting, which will take place at 5.30 p.m. on Thursday afternoon, Dec. 16th, at the Royal Society of Arts, John Street, Adelphi. Abstracts of two papers will be read: "Possible Developments in Aircraft Engines," by Mr. H. Ricardo, A.M.Inst.C.E., M.I.Aut.E., and "The Installation of Aeroplane Engines," by Mr. A. J. Rowledge, A.M.I.Mech.E., M.I.Aut.E.

Owing to the advent of Christmas there will be no other meeting until Jan 20th, 1921, which will take place at 5 p.m. instead of 5.30 p.m., when the Right Hon. Lord Montagu of Beaulieu, K.C.I.E., C.S.I., A.M.Inst.C.E., A.M.I.Mech.E., will read a paper on "The Cost of Air Ton-Miles Compared with other Forms of Transport."

COUNCIL.

Owing to the third Tuesday in the month falling so near to Christmas no meeting of Council will be held in December. The next meeting will, therefore, take place at the Society's Offices at 5 p.m. on Tuesday, Jan. 21st, 1921.

CHRISTMAS HOLIDAYS.

The Society's Offices, including the Library, will be closed from Thursday evening, Dec. 23rd, to Tuesday morning, Dec. 28th.

AIR MINISTRY LOAD FACTOR COMMITTEE.

At the request of the Air Council, Lieut.-Col. M. O'Gorman, C.B., and Capt. Geoffrey de Havilland, O.B.E., A.F.C., have been nominated to represent the Society on the reconstituted Air Ministry Load Factor Committee.

LIBRARY.

The following books have been received and placed in the Society's Library:—"Rigging, The Erection and Trueing-up of Aeroplanes," by F. W. Halliwell; "The Airplane," by Frederick Bedell; "Practical Aeroplane Construction," by Frederick T. Hill, A.F.R.Ae.S.; "Jane's All the World's Aircraft, 1920," by C. G. Grey.

BINDING CASES FOR THE JOURNAL.

Arrangements have been made for the binding of complete sets of the Journal for 1920 in blue cloth cases with gilt lettering at a charge of 4s. 6d. per volume, including the supply of the case. Members who desire to take advantage of this arrangement should forward their sets direct to the Lewes Press Ltd., High Street, Lewes, at the same time sending a remittance for 4s. 6d. to the Secretary at the Society's offices. A note stating the name and address of the sender should be enclosed in the parcel to the binders. The complete volumes will be returned direct to Members postage paid.

Dec. 10th, 1920. W. LOCKWOOD MARSH, Secretary.

THE ROYAL AERO CLUB.

OFFICIAL WORLD'S RECORDS PASSED BY THE FEDERATION AERONAUTIQUE INTERNATIONALE.

6TH JANUARY—20TH OCTOBER, 1920.

CLASS C—(FLYING MACHINES).

No. 1.—DURATION (returning to the point of departure without alighting).—L. Boussoutrot and Jean Bernard: Villesauvage-La Marmogne, 3rd-4th June, 1920; Farman "Goliath," 2-260-h.p. Salmson; 24h. 19m. 7s.

No. 2.—DISTANCE (returning to the point of departure without alighting).—L. Boussoutrot and J. Bernard: Villesauvage-LaMarmogne, 3rd-4th June, 1920; Farman "Goliath," 2-260-h.p. Salmson; 1,915.2 kilometres.

No. 3.—HEIGHT (returning to the point of departure without alighting).—R. W. Schroeder, Dayton, Ohio, Feb. 27th, 1920; Le Pere Biplane, 400-h.p. Le Pere; 10,093 metres.

No. 4.—SPEED.—(a) Speed over a given Distance (returning to the point of departure):—

100 Kilometres.—B. de Romanet: Villesauvage-Gidy, Sept 25th, 1920. Spad-Herbemont, 300-h.p Hispano-Suiza; 23m. 16 1/5s.

G. Kirsch, Villesauvage-Gidy, Sept. 25th, 1920, Nieuport, 300-h.p. Hispano-Suiza; 22m. 18s.

Sadi Lecointe, Villesauvage-Gidy, Sept. 25th, 1920, Nieuport, 300-h.p. Hispano-Suiza; 21m. 28s.

200 Kilometres.—G. Kirsch, Villesauvage-Gidy, Sept. 28th, 1920, Nieuport, 300-h.p. Hispano-Suiza; 48m. 52 3/5s.

B. de Romanet.—Villesauvage-Gidy, Sept. 28th, 1920, Spad-Herbemont, 300-h.p. Hispano-Suiza, 46m. 7s.

Sadi Lecointe.—Villesauvage-Gidy, Sept 28th. 1920, Nieuport, 300-h.p. Hispano-Suiza; 43m. 42 3/5s.

1,000 Kilometres.—L. Boussoutrot and Jean Bernard.—Villesauvage-La Marmogne, June 3rd-4th, 1920, Farman "Goliath," 2-260-h.p. Salmson; 10h. 19m. 46s.

1,500 Kilometres.—L. Boussoutrot and Jean Bernard.—Villesauvage-La Marmogne, June 3rd-4th, 1920, Farman "Goliath," 2-260-h.p. Salmson; 16h. 42m. 8s.

(b) Greatest Speed per hour (over a straight line course of 1 kilometre):—

Sadi Lecointe.—Villacoublay, Feb. 7th, 1920, Nieuport, 300-h.p. Hispano-Suiza; 275.862 kilometres.

Jean Casale.—Villacoublay, Feb. 28th, 1920, Spad Herbemont Biplane, 300-h.p. Hispano-Suiza; 283.464 kilometres.

B. de Romanet.—Buc, Oct. 9th, 1920, Spad-Herbemont, 300-h.p. Hispano-Suiza; 292.682 kilometres.

Sadi Lecointe.—Buc, Oct. 10th, 1920, Nieuport, 300-h.p. Hispano-Suiza; 296.694 kilometres.

Sadi Lecointe.—Villacoublay, Oct. 20th, 1920, Nieuport, 300-h.p. Hispano-Suiza; 302.529 kilometres.

No. 5.—USEFUL LOAD TRANSPORTED.—Duration (1,500 kilogrammes):—

G. T. R. Hill.—Cricklewood, May 4th, 1920, Handley Page W.8, 2-450-h.p. Napier "Lion"; 1h. 20m.

Height (1,500 kilogrammes):—

G. T. R. Hill.—Cricklewood, May 4th, 1920, Handley Page W.8, 2-450-h.p. Napier "Lion"; 4,267 metres.

TO TECHNICAL MEN.

Surprising though it may seem, there is a firm in the Aircraft Industry who actually wants to engage draughtsmen and designers. The firm in question is George Parnall and Co., whose advertisement for technical men will be found in its proper place. Thus, when everybody is so pessimistic about business of all kinds and about aviation in particular, it is most encouraging to find that somebody is actually spending money on development work. One hopes most sincerely that before very long Mr. George Parnall may reap the reward that he is now doing so much to earn.

PERSONAL NOTICES.

BIRTHS.

BROWN.—On Dec. 11th, to Hilda, wife of F. Giles Brown, O.B.E., (late Major, R.A.F.), Rock House, Greenhill, Sheffield—a daughter.

HANDLEY PAGE.—On Dec. 10th, at "Lymes Holme," Stanmore, the wife of F. Handley Page—a daughter.

HARRIS.—On Nov. 29th, at Digby, Lincs., the wife of Squadron Leader A. T. Harris, R.A.F., a daughter.

HAWKINS.—On Dec. 5, Margaret, the wife of Rev. R. H. Hawkins (late Captain, S. Staffs. Regt. and R.A.F.), of 51, Adshead Road, Dudley, a daughter.

COMING EVENTS.

DECEMBER.

16th, Thurs.—R.Ae.S lecture. "Possible Developments in Aircraft Engines," by H. Ricardo. "The Installation of Aeroplane Engines," by A. T Rowledge.*

18th, Sat.—Felixstowe Air Station Reunion Dinner at the Connaught Rooms, W.C.2, at 7 p.m. Particulars from Mr W Kitson, 22, Manor Terrace, Felixstowe.

JANUARY—1921

1st, Sat.—No. 41 Squadron's Dinner at Oddenino's. Particulars from Flight Lt. K. C. Leask, Hillingdon House, Uxbridge.

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A FEW copies of the "History of 24 Squadron R.A.F.," by Captain A. E. Illingworth and Major V. A. H. Robeson, M.C., with a foreword by Air Marshal Sir H. M. Trenchard, K.C.B., D.S.O., may still be bought, price 16s.—THE AEROPLANE, 61, Carey Street, W.C.2.

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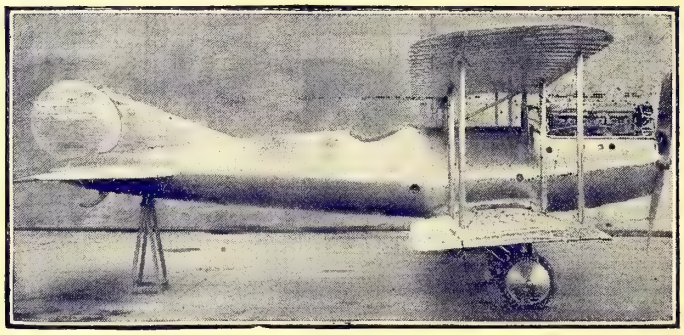

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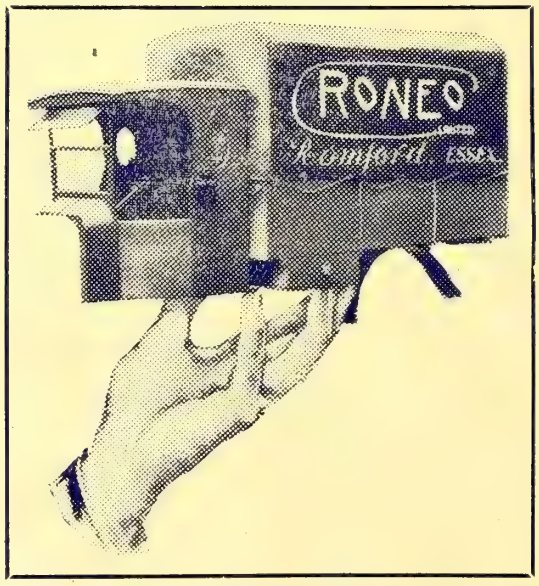

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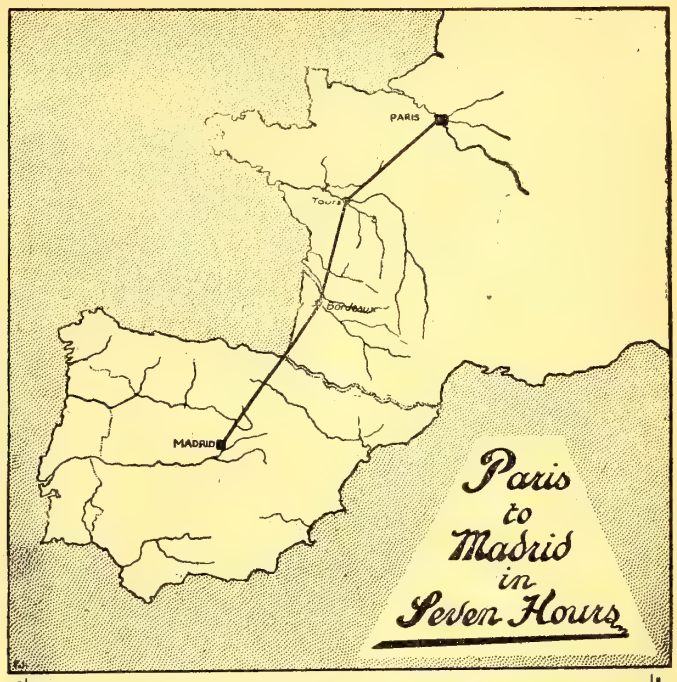

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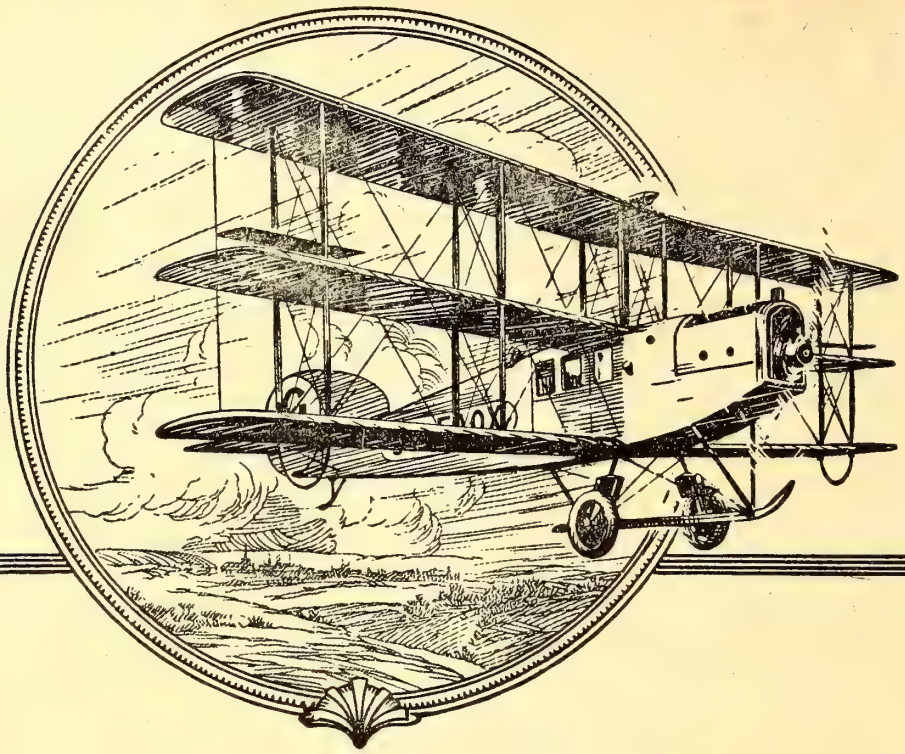

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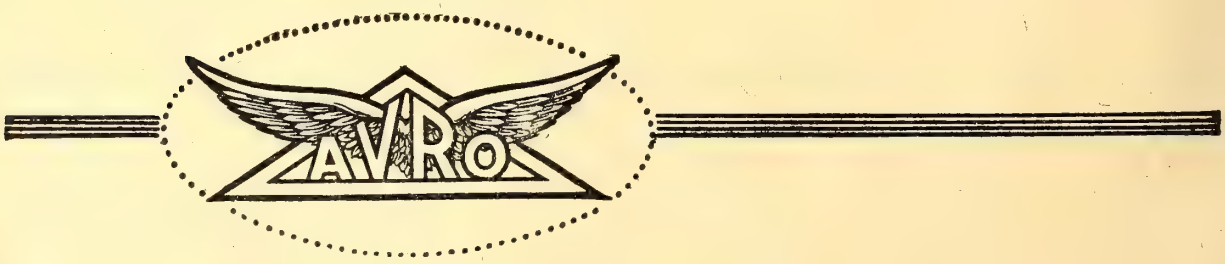

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ON AIR LINES—II.

While those most concerned are busy inducing the British business man to understand that the goods-carrying aeroplane or the passenger-carrying aeroplane is "meant to do that," and is nothing in any way wonderful, those who are in charge of the technical side of commercial aviation might be well employed in overhauling their general organisation both as regards the ground organisation of the air routes, which is purely the affair of the Department of Civil Aviation, and the technical organisation of the air lines themselves, which is very much the affair of the proprietors of the air lines.

Partly by good judgment and partly by good luck we have had an astonishingly high percentage of efficiency on the cross-Channel air lines during the past year. Again, this is not wonderful, the things are "meant to do that," but no matter how well a thing is meant to operate there is always a large amount of satisfaction to be got out of a high percentage of efficiency.

No doubt about six months hence we shall receive from the Department of Civil Aviation an elaborate official report giving all the figures of the work of the air lines during the past six months. It will be remembered that the figures from March to September appeared about ten days ago. One suggests that it would be well to issue a brief interim report before the end of January giving merely the total of miles flown, of hours in the air, of passengers carried (the number of pilots should be given separately), and the casualties for the calendar year 1920. These figures would be of the highest possible value for advertising purposes, and for the use of the goods-traffic canvassers of the air lines.

So far as one can remember seven passengers have been killed, or have died of injuries, in accidents to "joy-ride" aeroplanes. No doubt as many have been killed by falling off steam roundabouts at fairs. So these can be omitted from the statistics of serious flying.

It is eminently satisfactory to be able, without waiting for the official report, to state that so far as casualties are concerned only three passengers have been killed on the regular cross-Channel air lines. It is impossible to calculate the mileage accurately, either as aeroplane-miles or passenger-miles, but a moderate estimate, taking the fact that almost 2,700 aeroplanes have crossed the Channel since this time last year, and taking the average of the London-Paris, London-Brussels, and London-Amsterdam trips at a little over 250 miles, we find that at least 700,000 aeroplane-miles have been covered on the cross-Channel routes alone in the twelve months, which includes the bad months early in the year before air transport even began to be popular.

If we take the average number of people on the machines as four each, which is well on the safe side, seeing that even empty machines carry one pilot, and that all Handley Pages carry a pilot and mechanic, against which loads of eight to a dozen passengers are carried week after week, we arrive at a rough total of 2,800,000 person-miles, with three fatalities to paying passengers, and three more among the employees of the air lines, which is a record of which many railway lines might be proud.

It is of interest to note that Handley Page Transport, Ltd., claim to have carried 3,250 passengers during the twelve months, besides 1,650 pilots and mechanics, and to have covered 305,000 miles. Air Transport and Travel, Ltd., again reported to be deceased, claim to have carried 3,180 passengers, about 1,600 pilots, and to have covered about 393,000 miles.

If such figures as these are well rammed home into the head of the British Public they are bound to be convincing. And if they are properly communicated to the Press not even the least intelligent editor can refuse to publish them. When they are well digested by the British business man they must surely be enough to persuade him that his goods, if not his precious carcase, may be safely entrusted to air transport.

Necessary Improvements.

That being done, it remains to improve the running of the lines. Granted that goods sent by air are delivered days and often weeks in front of those sent by rail, it is still necessary to improve matters so that there may be no risks of delay at all. That is to say, the Air Ministry (Department of Civil Aviation) has to improve its machinery so that aeroplanes on the cross-Channel routes can get through in weather which at present would hang them up for hours, or perhaps a day. And the air lines themselves have to improve their equipment so as to eliminate all causes of delay or danger which can possibly be foreseen.

Moreover, if they want to cultivate passenger traffic, it is up to the air line people so to arrange their machines as to remove any anxiety on the part of passengers. Only thus can the air lines receive that best possible of all advertisements, the recommendation of a satisfied customer.

Emergency Exits.

[POST SCRIPTUM.—It is worthy of note that the whole of this article was written before the accident at Cricklewood occurred on Dec. 16th. One's opinion is not altered thereby, but very much confirmed. In that case the passengers evidently did not know of the emergency exits.—C. G. G.]

Let us take these points in their reverse order. Writing as a highly satisfied customer of Handley Page Transport, Ltd., one can recommend that line to one's friends particularly on account of one feature about the machines. Personally one has a greater fear of being drowned than of any other death, greater even than the fear of being burnt in the air. Therefore one likes the Handley Page air liners, and the D.H.18s, which are similarly fitted, because they have thoroughly adequate emergency exits in the roofs of the cabins, so that if one's machine comes down in the sea and floats, as it probably would, with the door under water (and anyhow one believes that the door is locked from the outside) one can climb out onto the deck and sit there till picked up.

How long the machine would float is another question, so one would be happier still if inflatable life-buoys, such as are used by some cross-Channel pilots, were handed out to passengers. But, there are other machines which have no emergency exits, so that in the event of either a forced alighting in the sea, or a turnover followed by fire on land, the passengers, boxed in as they are, would be either drowned or burned like rats in a trap.

Such machines should be altered by their owners in the interests of their businesses. But, if they are not altered by the owners, they should be condemned by the Air Ministry (A.I.D.) as unfit for use as passenger machines, and fit for goods only.

It is not enough to argue that passengers can scramble out through windows in the side or through the pilot's cockpit. The windows may jamb, or the pilot may be stunned and impossible to move. The emergency exits should be in the roof and of such a size that one can fall out through them, and not have to do a Houdini act to extricate oneself.

[The Cricklewood accident illustrates exactly this argument. One, at any rate, of the passengers who was killed might have escaped if the windows had been big enough for him to get through. Nevertheless, if he had known of the exit in the roof he could have got out that way. The doors of passenger machines are locked and sealed for the purposes of the Customs Officials, which is a dangerous practice. But there is no reason why there should not be emergency exits in the sides and floors of aeroplanes as well as in the roofs. —C. G. G.]

Floatation Gear.

Furthermore, all regular cross-Channel machines should be capable of floating for at least six hours if they come down in the sea. Probably some of them would do so. But they ought all to be designed to do it.

[The affair in the Irish Sea on Dec. 17th proved that a Handley Page will float for two hours.—C. G. G.]

One is not satisfied with the argument that a multiple-engined machine can still get across even if one engine stops. It may have happened on several occasions. But the next time the second engine may stop also. Or it may be necessary to come down in the Channel owing to a broken control of some sort.

Passenger machines, at any rate, should be built with floatation bags in the fuselage, or the fuselage itself should be water-tight. It is quite possible to make it so.

Fire Prevention.

Granted that all possible precautions are taken against fire, by forbidding smoking in the cabin in some machines, and by putting the petrol-tanks outside the fuselage in many machines, there is always a chance of fire. Even railway carriages catch fire sometimes.

Therefore one suggests that fire-extinguishers should be carried in the cabins of all passenger machines. One is told that they are always carried in the pilot's compartment. That is no use if in a crash damage is done to the pilot and/or mechanic, and the passengers cannot get at the extinguishers just when a fire is starting.

Also it comforts the passengers to see that the proprietors of the air line consider their safety and peace of mind so carefully.

[This point also occurs in the Cricklewood case, though in this case no amount of fire extinguishers in the fuselage could have saved the machine.—C. G. G.]

The Pilot's Position.

A point which is of considerable importance is the position of the pilot. He ought to be placed so that he has the best possible view, not for landing—for no decent pilot looks at the ground when landing—but so that he can see where he is going.

There is one phenomenon of which some designers seem to be ignorant. That is that when there is a slight haze and the sun is low it is impossible to see a yard in the direction of the sun, though one can see for five or six miles when the sun is at one's back.

A few weeks ago one met at Croydon the pilot of a French machine which has the pilot's seat on the left side, with a deck the full width of the fuselage on the right. He complained that he had lost his way between Lympne and Croydon because the visibility was so bad.

As a matter of fact the visibility was very good, except towards the sun. Sitting as he did on the left of the machine, with the sun low in the west, and flying on a north-west or westerly course from Boulogne to Croydon, he could see nothing on his left or ahead, and his view to the right was cut off by the deck. If he had had an outlook to the right he could have seen everything within six miles of him.

One has noticed this when crossing the Channel from France in a Handley Page on a sunny afternoon. On the left one could see nothing, except by looking vertically downwards, on the right one could see Gris Nez when half way across.

Therefore one suggests that all machines should give the pilot a clear view downwards on either side. Otherwise they are apt to be dangerous, either in landing, or because the pilot may lose his way and be forced down in bad country.

A Hint to Designers.

There are many other points about the design of machines for civil aviation which need improving, and designers ought to consult with pilots, mechanics, and habitual passengers before dashing off to design commercial machines in the light of war-time experience only. The more they do so the more and the sooner commercial aeroplanes will depart from the conventionalised design of war machines.

Apropos consulting others, when Mr. Fritz Koolhoven designed the famous F.K.26 B.A.T.—the first commercial aeroplane designed *ad hoc*, and still unsurpassed as a design—one remonstrated with him for putting his pilot right aft behind the cabin, and pointed out that in a bad crash probably the passengers would be killed and the pilot would survive. "Good," said friend Fritz, "then I shall get an intelligent explanation of how the accident happened."

There is much sense in the idea, but chiefly the moral of the tale is that designers ought never to design a machine without first getting a really experienced pilot to advise them on practical points. And there would be no harm in consulting some passengers also. Besides which mechanics who have done much work on the maintenance of machines and engines in constantly good running order can generally give designers useful hints about how and where various gadgets ought to be placed, and where they ought not.

One fears that some quite clever designers are rather too apt to trust too much to their own cleverness, instead of seeking information from those whom they hope will use their machines.

Ground Organisation.

Given improved aeroplanes and engines it might be thought that there would then be less need for improvement in the ground organisation to be provided by the Department of Civil Aviation. As a matter of fact the better the machines the more traffic there will be, and so the greater will be the need for perfect organisation on the ground.

As the machines improve there will be more and more tendency to trust the mechanism and fly in bad weather, especially in fogs. And it is just then that the Air Ministry's help will be most needed, to provide prompt and reliable weather information and to give pilots their position and direction when out of sight of the ground.

Even as things are at present a very little expense, a very small fraction of that £36,000 of wages which the Department of Civil Aviation saved so unnecessarily, would provide much greater safety and would save a vast amount of nerve strain to the pilots on the London-Paris lines.

It is true that on a machine properly equipped with wireless the pilot can talk to Lympne as soon as he leaves London, and to St. Inglevert before he gets to Lympne, and to Paris as soon as he reaches the Channel. In fact, one Handley Page machine recently talked to Cricklewood all the way across France, and was still within hearing when landing at Le Bourgêt. But that is not what is wanted.

Mr. Marconi of Lympne and Mr. Marconi at St. Inglevert [as poor Bager called them in his amusing letter published a few weeks ago] can tell the pilot what sort of weather they are having near the Channel. Mr. Marconi at Cricklewood or Mr Marconi at Croydon can tell him which aerodrome is the more free from fog. Mr. Marconi at Le Bourgêt can tell him whether to stop at St. Inglevert because of fog near Paris. But there is no Mr. Marconi to tell him what the weather is like over the real danger zones on the rest of the route, namely, the bit between Maidstone and Epping on one route, and between Maidstone and Caterham on the other, and the fog areas by the Somme and about the valley of the Oise.

An Example in Point.

One had two excellent examples of this when going to and coming from Paris at the time of the Gordon Bennett race.

On the outward journey, with that excellent pilot Mr. Capps in charge, we had beautifully clear weather all the way to Boulogne. Near Etaples, over the sand-dunes, we began to run over little fleecy clouds. As we got nearer the Somme the clouds grew thicker, till finally all one could see in front was a floor of clouds, with, apparently, a very high cloud-bank some ten miles ahead.

There were still little holes in the clouds below, so Mr. Capps throttled down and dived through a hole. After which we waddled along about 200 feet from the ground till we reached Abbeville, and there it was perfectly clear again.

Nearing Beauvais we met clouds again, and went down till over the high ground south of Beauvais we were only 100 feet or so from the tree-tops. And, again, when we reached the Oise at Persan the upper air was clear.

Now if there had been observers on the Somme and on the hills behind Beauvais, and on the Oise, they could have told Mr. Capps by wireless that there was clear air farther on, and we could have stopped up above the clouds, and so have saved the trouble of going up and down. Also the pilot would have been saved the extra physical exertion of keeping the machine on a level keel when flying over alternating plains and forests on a hot day. And there would have been no danger of being "pinched" between the clouds and the hills south of Beauvais, which have caused many a crash.

The Return Journey.

Coming back provided even a better example of the need for proper observation. Mr. Rogers, one of the safest of the Handley Page pilots, and one of the most persistent fliers in fogs, was in charge.

When the passengers arrived at Le Bourgêt to embark the other side of the aerodrome was hidden by a thick mist, and St. Inglevert reported by wireless that visibility was *nil*. Mr. MacIntosh, who was in command of the Handley Page fleet at Le Bourgêt, and has proved himself to be as good a manager as he is a pilot—which is saying a good deal after his flight across the Channel from Paris on December 6th, when none of the boats dared to cross—delayed the start of the machine till all fog had gone and only a slight haze remained.

The going was delightful till near Beauvais, where we began to run over clouds. Mr. Rogers held on till the clouds appeared to be almost continuous. Then through a break he caught sight of Beauvais itself, and promptly dived through a very solid bank of cloud for several hundreds of feet, coming out right over the top of Beauvais Cathedral, and certainly not more than 150 feet above it.

He explained afterwards that he would have come down earlier, but for the fact that he could not tell whether the clouds were down touching the woods on the hills south of Beauvais or whether there was room below them. He decided that it was safer to carry on above the clouds until he knew we were north of the high ground.

When we did get through we found that the clouds were at about 300 feet, so we kept along at about 200 feet till we arrived near the Somme, and there the clouds disappeared and dissolved into a light haze, which limited visibility to about five or six miles over the land, though on the sunny side (to the left) one could see nothing except downwards.

WINTER SPORTS.

Just at the moment the attention of those of us who can afford a Winter Holiday is turned in the direction of Winter Sports, and among these sports one of the most popular is Ski-ing. Until comparatively recently the Ski has been the exclusive property of the people of Norway and Sweden. More recently the Ski has been adopted as an aid to sport by holiday makers in the mountains of France, Switzerland and Germany.

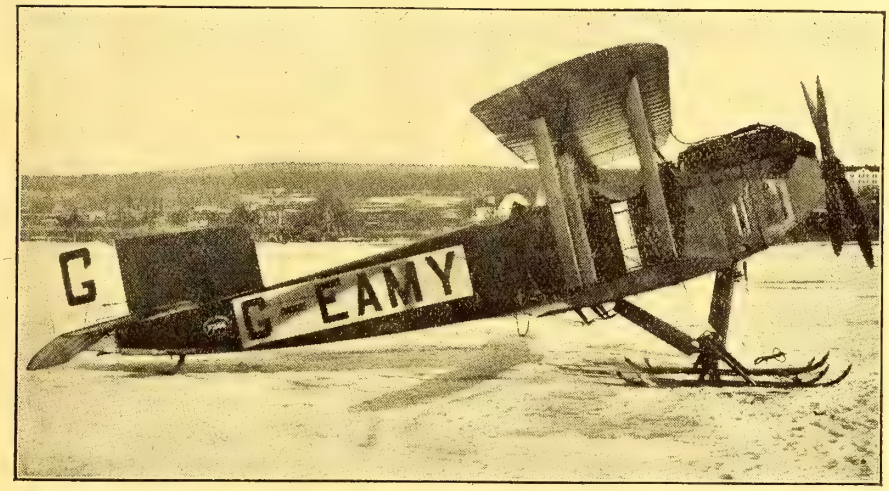
Naturally the Aeroplane, being the most modern of the World's Vehicles, cannot afford to lag behind mere human beings in its use of any aid to efficiency. Consequently the aeroplane has also taken to using Skis when they can improve its usefulness.

THE FIRST ATTEMPT.

The first instance on record of Skis being fitted to aeroplanes was during the war, when the R.F.C. Training Brigade in Canada fitted Skis instead of wheels to their school machines, and as the result put in more hours of flying in Canada during the winter with fewer machines and fewer instructors than did the larger section of the Brigade which went South to the temperate climate of Texas.

The next use of Skis was, very appropriately, in Sweden, the original home of Skis, when several "joy-ride" machines of small type were fitted with this useful form of landing gear and operated with considerable success, when wheeled undercarriages would have been impossible.

But, as usual, when an important step forward had to be taken in the progress of Aviation, it was a Fairey Biplane which was chosen for the purpose. Here is seen the first high-powered aeroplane capable of carrying a really commercial load which was ever fitted with a Ski undercarriage.



The Fairey Biplane (375 H.P. Rolls-Royce "Eagle" Engine) belonging to Lieut. Col. G. W. P. Henderson, M.C., and fitted by him with double Skis for use in Swedish winter weather.

COMMERCIAL SKIS.

This Fairey Biplane, which was a standard seaplane built during the war, and afterwards re-built with "disposal" parts for Civil Aviation purposes, was flown as a seaplane by Lieut.-Col. G. W. P. Henderson, M.C. from England to Sweden, via Holland, Germany and Denmark. After arriving in Sweden she was used for several months as a commercial seaplane until Winter froze all Sweden's water-ways.

Thereafter she was fitted with a special undercarriage for use on snow and ice. The ordinary Ski-undercarriage was obviously too light for a machine of her speed and power, so Colonel Henderson devised a scheme of double Skis, which gave the necessary bearing surface without undue length. Two Skis side by side on each side of the fuselage, close together but with space between for the snow to clear itself, had precisely the desired effect. And so the first large aeroplane to be fitted with a Ski undercarriage proved to be an immediate success.

WHETHER AS A SEA MACHINE, A LAND MACHINE, A SNOW MACHINE, A DECK MACHINE, OR AN AMPHIBIAN THE SUCCESS OF THE FAIREY IS ALWAYS CERTAIN.

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An Explanation and a Remedy.

Now it so happened that the cloud-banks were only fogs from the Somme and Oise valleys raised by the sun and drifted north in each case. But supposing, in the case of Mr. Capps, the fog-bank from the Oise had been right down on the hills behind Beauvais, he would have been trapped between them and the ground, and would either have had to land in the hills or would have had to chance going up through the clouds in the hope of finding holes in the clouds farther south.

In the case of Mr. Rogers, the fog round Beauvais, being north of the hills, might have been right down to the ground, and if he had not found the hole which showed him Beauvais clear from fog we might have carried on over the fog, only to find the whole of France north of the Somme under thick fog, so that it would have meant an almost certain crash in landing—or going all the way back to Paris.

The obvious moral is that observers are needed at intervals of 20 miles or so all the way from Boulogne to Paris, each with a direct telephone wire to St. Inglevert and Le Bourgêt, to report the condition of the weather at intervals of a few minutes. Then the pilots could learn by wireless from either station precisely what was the condition and position of fogs and clouds at any point in between.

In the instances mentioned, if such information had been available, both Mr. Capps and Mr. Rogers would have kept above the clouds all the way, and so would have been saved much hard work and anxiety. For undoubtedly they had to work hard to keep their machines on an even keel when so near the ground. And they succeeded so admirably that at no time on either trip did the machine move as much from a horizontal position as does an ordinary railway carriage.

As a means of travelling in comfort these Handley Page machines far surpass any other method of conveyance yet invented, but, for all one's inexperience of practical aviating, one was able to appreciate the fact that at very little expense improvements could be made in the ground organisation of the route which would make the journey even more comfortable and very considerably safer. If a railway company has to have a signal box and relays of signalmen for each box at intervals of two or three miles all the way along a railway, surely it is no disgrace to an air line if, for mere safety's sake, it has to have a signal-box, equipped only with a telephone and not with all sorts of expensive machinery, at intervals of 20 miles.

These are merely points which are self-evident to anyone who is closely in touch with the cross-Channel pilots. These men have been doing splendid work during the past twelve months in developing civil aviation. Unhappily many of them have fallen on evil days, owing to the reported shutting down of the A. T. and T., Ltd., and the decrease in the number of machines in use during the winter on all air lines. It is therefore the more earnestly to be hoped that something may be done, both by the aircraft firms and by the Air Ministry, to stimulate an early revival of commercial aviation in the New Year, so as to bring these experienced pilots back to work again.

When once work does start again the various points mentioned in this and the preceding article should receive particular attention, for by giving confidence to passengers, by decreasing minor accidents and delays caused by badly arranged information concerning weather, and by decreasing the nervous strain on the pilots, much may be done to make our air lines do efficiently the things that they are meant to do.—C. G. G.

THE FAILURE OF CIVIL AVIATION.

Serious as were the moral effects on aviation of the closing down of the Aircraft Manufacturing Co., Ltd., and the Sopwith Aviation Co., Ltd., earlier in the year, their disappearance was in fact a trivial matter compared with the closing down of Aircraft Transport and Travel, Ltd. Few people were particularly interested in the output of aeroplanes, but very many people have become interested during the last twelve months in the rapidity and regularity of air mail and air express work and air passenger work. The immense number of passengers carried by A.T. and T., Ltd., is sufficient proof of this.

The closing of A.T. and T., Ltd., may be ascribed primarily to bad management and excessive optimism at various times in the firm's earlier days, and secondly to lack of intelligence among the directors of the B.S.A.-Daimler combine, who became responsible for the finances of A.T. and T., Ltd. by buying the Aircraft Manufacturing Co., Ltd., but personally one puts the main burden of the blame for the failure on the shoulders of the Post Office and the Air Ministry.

So far as the Post Office is concerned, despite all the fair words Mr. Illingworth, the Postmaster-General, has spoken about air transport, one believes either that he personally is hostile to aviation or that he lacks the intelligence to understand the benefits which aviation could confer on his Department.

Admitting that the British Inland Postal Service is the best thing of its kind in the world, a properly run letter and parcels post to and from the Continent by air would materially increase the reputation of the British Post Office, and would bring great kudos to the Postmaster-General who established it. Mr. Illingworth apparently lacks the brains to understand this.

One gathers on fairly good authority that the permanent Civil Servants of the Post Office are fully alive to the possibilities of air mails and would willingly send the whole of the Continental mail and parcels post by air if permitted to do so. But they appear to have all their efforts nullified by the hostility or the lack of intelligence—whichever it may be—of their political chief, Mr. Illingworth. If the Continental mails and parcels post had been sent by air during the past summer, A. T. and T., Ltd., which held the air mail contract, would by this time have been a flourishing concern and British trade would have benefited very materially by the greater reliability and speed of an aerial parcels post.

The Air Ministry is to blame for the fact, though it has done quite a good deal for civil aviation in a general way, it has not spent the money allocated to it as it might have spent in encouraging civil aviation, which encouragement would have included A. T. and T., Ltd. And it has not brought to bear the immense political influence which is at its command if the various members of the Air Ministry who can wield political influence had exerted their full strength.

One cannot help feeling that the Air Ministry, and, more particularly, the Department of Civil Aviation, has not exerted the driving force and influence which it might have exerted in favour of the development of commercial aeronautics. The result is that to-day we have an immense Civil Aviation machine, including the London Terminal Aerodrome, the Lympne Aerodrome, wireless stations, highly-paid officials, and all the rest of it, existing almost solely for the benefit of a few French machines which are highly subsidised by the French Government.

Either General Sykes and his Department must bestir themselves very energetically during the next few weeks or they must expect to have some very awkward questions asked in the House as to why the British taxpayer should be mulcted in large sums for the benefit of a Department which apparently exists only for the convenience of foreign aviators. It is on such occasions as this that one rather regrets that Germany did not win the war, so that this country might be run by Departments which would be, if less amiable, at any rate forceful and efficient.—C. G. G.

THE POST OFFICE AGAIN.

The amazing imbecility of the business man who does not use the cross-Channel air lines is excellently illustrated by a recent transaction from this office. Two small parcels were sent from this office to Paris on November 26th. Owing to a mistake on the part of a clerk these parcels were sent by ordinary Parcels Post instead of air parcels express. One of the parcels was delivered on December 11th, and the other on December 14th. If they had been sent by air with the proper Customs declaration forms they would have been handed in at the express parcels office one day and delivered to the addressees in Paris the following day.

AN AGREEMENT BETWEEN FRANCE AND GREAT BRITAIN.

The *Official Gazette* has published the text of the agreement entered into between Great Britain and France which permits the free passage of private and commercial aircraft between these countries, whilst reserving the right to establish prohibited areas for military reasons. All aircraft must carry a log and a traffic permit, and pilots must have in their possession a certificate showing their qualifications. The use of wireless apparatus is forbidden without special permission.

This agreement will cease to be in force as soon as the International Convention for Aerial Navigation, drawn up by the Peace Conference, becomes effective.

The Staff and Editor of "The Aeroplane" wish to All Readers of this paper, at Home and Abroad, Service and Civilian, All Good Wishes for Christmas and the New Year, and a Happy Issue out of all the Afflictions of Aviation in a Near and Prosperous Future.

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Major C. C. Turner,
Manchester Guardian, 25/11/20.

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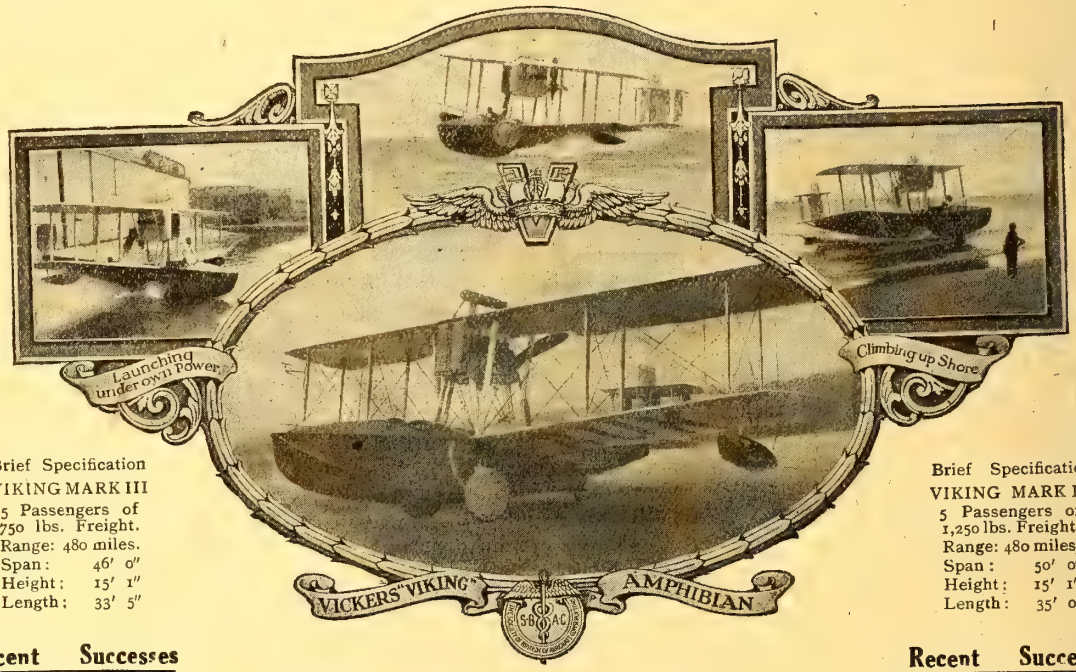

Brief Specification
VIKING MARK III
5 Passengers of 750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Recent Successes

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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NORWICH—16, White Lion Street.

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Span: 50′ 0″
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Length: 35′ 0″

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SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

THE WEEKLY COMMENTARY.

There is reproduced below a fairly lengthy summary of a paper read by Mr. Hector Sleeman, of Aerial Transport, Ltd. (Australia), on certain aspects of aviation in the British Dominions. This paper is reproduced at greater length than is usually possible for two reasons. The first is that the paper itself is of very great interest, and it is desirable that those interested in Aviation should be aware of the excellent work of the Institution of Aeronautical Engineers in securing publication of such a paper.

The second reason is that the paper itself bears a very direct relation to an article recently published in these columns, entitled "Aviation in the Wilderness" (Nov. 3rd, 1920, page 729), wherein the opportunities afforded for the development of commercial aviation by the less densely populous parts of the earth were pointed out.

The article immediately following, which describes Capt. Carroll's pioneer work in Malaya, has a bearing on the same subject.

On page 936 are printed brief abstracts of two papers dealing with the aero engine which were read before the Royal Aeronautical Society on the afternoon of Dec. 16th. That due to Mr. Ricardo dealing with the possible thermodynamic improvement of the internal combustion engine is of great importance to engine designers, who should secure the full report of the paper which will appear in the Journal of the Society in due course.

THE POSSIBILITIES OF AVIATION IN AUSTRALIA.

The paper which was read before the Institution of Aeronautical Engineers on Wednesday, Dec. 15th, by Mr. Hector Sleeman proved to be of very considerable interest. The title of the paper was "The Possibilities of Aviation in the Dominions."

Mr. Sleeman is managing director of Aerial Transport, Ltd. (Australia), and general secretary of the Australian Aero Club, and in fact his close acquaintance with Australian conditions led him quite wisely to refer specificially to Australasian conditions, though he fairly justified his more extended title on the ground that in general the conditions in the Dominions were similar in many respects.

THE PAPER.

Conditions in England are not ideal for commercial aviation, owing to certain inherent disadvantages, such as adverse climatic conditions, the competition of excellent means of transport already in existence, the small distances between centres, and the conservatism of the population. The only commercially possible routes are those to the Continent, and the wonderful degree of efficiency attained by the companies operating these routes, under adverse weather conditions, has proved that the operating difficulties are not serious, provided the ground organisation is efficient.

In most of the Dominions the conditions are more favourable, and it appears that the development of British commercial aviation will be to a great extent carried out in the Dominions. For purposes of example and illustration, the Australian conditions will be cited, but allowing for the modifications necessary for different climatic and topographical problems, the conditions will apply to most of the other Dominions.

AUSTRALIAN AIR ROUTES.

The first consideration of any transport service is a constant high load factor [Mr. Sleeman here uses "load factor" in its proper sense of the ratio between load actually carried, and the load capacity of the plant in use.—Ed.] and all other considerations must give way to the possibilities of a good load factor and a large saving in time. In Australia, the best route, from a flying point of view, is between Melbourne and Adelaide, but without flying at night there would not be any gain of time over the existing train service, and the loading is not so great as on other routes, and would fluctuate violently. The Melbourne and Hobart route, on the other hand, offers exceptionally good loading, and the gain of time amounts to 21 hours on a trip of 430 miles airline.

The speed at which business can be transacted depends on the speed of communication and transport available. The conditions in most of the Dominions leave much to be desired, but in Australia, with an area twenty-four and a half times hatt of England, Scotland, Wales and Ireland, and a population slightly less than that of Greater London, it is impossible to build and maintain roads and railways on a scale comparable to those in this country. Between Brisbane and Sydney there is a single railway line with a break of gauge at the State border. These cities are about 700 miles apart, and the time by train is 27½ hours, and the service is one train per day each way. A single line telegraph is the only means of rapid communication. Between Melbourne and Sydney, and Melbourne and Adelaide, the conditions are much the same. Between Melbourne and Hobart the means of transport is by steamer between Melbourne and Launceston, crossing Bass Strait, which is noted for rough seas, and by train between Launceston and Hobart. The time taken on this trip is 27 hours for a distance of 430 miles.

The population is to a large extent concentrated in the capitals of the States and in the large cities, and the distances between these centres is great (average 450 miles), the existing means of transport is poor and rapidly proving inadequate. Additional road or rail facilities would be financially impossible, but an air route does not require more than a small sum spent on it and has the further advantages that an unprofitable route may be closed down at any time.

LANDING FACILITIES AND TERMINAL STATIONS.

To obtain the maximum efficiency, landing grounds of about 400 yards by 400 yards or more are necessary, situated from 15 to 20 miles apart.

Terminal aerodrome sites should be purchased and the price depends on the location. It is good policy to get the terminal ground as near the centre of the city as possible, as although speed in the Dominions will not be the necessity it is here, the time taken to and from the cities to the landing grounds must be as small as possible.

With good landing facilities available the only real difficulty to be surmounted, as far as ground organisation is concerned, is that of wireless communication. The workshop buildings and plant will require to be much more extensive than those of a similar service operating in England.

The possibilities of securing the services of competent mechanics are good, as all the Dominions had a large number of mechanics with the Air Force during the War as well as a number employed on aircraft construction and inspection. There are large numbers of pilots available, and after a weeding out process sufficient pilots with engineering, navigation and flying knowledge and a proper sense of responsibility will be available for the next few years.

PUBLICITY—USEFUL AND OTHERWISE.

In a comparatively small community it is easy to approach personally individuals and companies, and, before the service is commenced, to obtain definite promises of loading. Advertising is less expensive and local interest is much greater.

The average man in the Dominions, at the time of the Armistice, had not seen an aeroplane or airship and had no

idea of their possibilities. After the Armistice the vast quantities of Press matter, written either by irresponsible enthusiasts or people who knew nothing of aircraft or transport, led the public to look for performances by aircraft that were, and are, utterly beyond their capabilities. This over boosting, and lack of realisation of the limitations of the performances of aircraft, on the part of these "experts" was worse for the industry than ignorance and has been much more difficult to deal with, but the contact with joy-riding machines and the excellent results obtained with British machines and pilots, has made the public realise the possibilities and limitations of commercial aviation to-day. The Australian Press has assisted greatly in this educational programme, but it still persists in giving undue publicity to aviation accidents.

The Necessity for Co-operation

It seems imperative that an air transport service in a Dominion should be run by, or in conjunction with, an existing transport organisation, such as a railway or shipping company, as such an organisation can introduce valuable business to the air service, provide booking facilities and can advise and guide the aerial transport company's operations. The air service will never be a serious competitor of railways or shipping services, but must be regarded as a paying, high speed adjunct.

Of Climates.

The climatic conditions in the various Dominions are so totally different that no comparison can be made. The Australian conditions are well above the average The southern part of the continent, including Tasmania, has what is probably one of if not the best flying climates in the world. The portion north of the Queensland and New South Wales border lies in the sub-tropical belt. The information on this portion of the Commonwealth is not as full as it could be, but there is definite evidence that it comes under the influence of monsoonal disturbances, and is at times subject to very heavy downpours of rain and to high-velocity surface winds.

The weather conditions of the southern portion of the continent are well recorded. All disturbances travel practically due east, and the normal rate of travel is about 400 miles per day. The Commonwealth Weather Bureau has a well-equipped service throughout this area, and publishes each morning a complete weather chart for the southern continent. With this chart, a barograph, and a few weeks' experience, an accurate forecast twelve hours ahead can be made. Wind velocities on the surface vary from still air—which is exceptional—to a maximum of 50 miles per hour. This maximum is also exceptional, only two cases being on record over a period of five years.

The general condition is that of a wind of from 10 to 25 miles per hour. Thundery conditions occur about weekly in the summer but are not violent, are purely local, and a passenger machine would pass around or over them

Clouds at altitudes of less than 1,000 feet are seldom met with, the usual height for the nimbus strata being 1,500 feet or over. Ground mists and fogs occur occasionally in certain well defined areas during winter, but the landing grounds can be so located as to avoid them, and where they may be encountered in flight they can easily be passed over.

Available Cargoes.

The most constant cargo available is mail matter, and it is in addition the most urgent. In the case of the Melbourne and Hobart mails the service is at present bi-weekly, the actual time in transit is 27 hours and the total time from closing at the General Post Office in either Melbourne or Hobart to deliver is 45 hours. With an air service the time of transit would be six hours and the time from closing of mails to delivery would be ten hours. At present all urgent business is transacted by cable, but with an air service daily each way, the lack of necessity for using the cable, except in really urgent cases, would increase the amount of mail matter available for transport, and decrease the congestion on the cable.

The one and only possible means of utilising the air mail to its full extent is for the Post Office officials here and in the Dominions to realise that air mails have arrived, and to assist them by using them to the fullest extent for carrying mail matter at ordinary rates.

Once the business community realises the value of this new rapid means of transport, the loading, especially in the progressive Dominions, will be all that the operators will be able to handle. In Australia the pilfering on the railways is very bad, and to avoid this source of loss, if for no other reason, a large quantity of goods would be sent by air.

The passenger loading is impossible to estimate, and is the most undesirable type of loading, as a passenger occupies large cubic space, limits height, requires attention, increases insurance rates (although the Australian Mutual Provident Society and other leading insurance offices have declared their ordinary life policy to cover the holder when travelling as a passenger by air), and necessitates a type of aircraft different from that required for freight and mails only.

Types of Aircraft Needed.

The selection of a type of aircraft and engine must be governed by the special requirements of each case. It is generally agreed that the non-rigid airship is of little commercial value except for aerial survey purposes; that the rigid airship is only an economical possibility when carrying loads greater than those possible for aeroplanes, over distances of 1,000 miles or more, or shorter distances over water or country with no possible landing space, and that for loads up to 1½ tons and distances up to 1,000 miles the aeroplane is, and will be for some time, the fastest and most economical means of air transport.

The capacity of the aeroplane must be governed by the probable loading available, and the type of engine and number of engines per machine by the local conditions. As a general rule, the multi-engined aeroplane seems the most reliable proposition, and where, as in Australia, each route has distances of 30 miles with no possible landing ground, a multi-engined machine is a necessity.

The introduction of the amphibian aeroplane should prove of great commercial value, as there are numerous places in the Dominions where a good landing ground close to the city cannot be secured, whereas there is a good harbour.

The Government's Share.

The defence of the Dominions is an extremely difficult problem. The enormous length of the Australian coast-line and the small population make patrol impossible except by air, and the small population cannot finance a fighting air force adequate for war purposes. With a skeleton permanent air force and a reserve composed of the aeroplanes and staffs of the air transport companies, a sufficient force will in time be available, and agreements have been entered into between the Commonwealth Government and the air transport company to provide for this.

The commercial aeroplane is not built for use as a fighting machine, but as most of these machines have been developed from war machines, they can usually be converted by the substitution of the war fuselage for the commercial. If the Dominion Governments held in store the war fuselages and fighting equipment, and subsidised the commercial machines that were convertible, they would secure their bombing planes at a fraction of the cost that they would have had to pay if they held the machines and staffs themselves.

Night flying in the Dominions will be possible as soon as the routes are properly lighted, but unless some less expensive method of lighting than that at present in use is devised the transport companies will not be able to light the routes themselves. It is advisable, however, for the Government to do this lighting.

In a country like Australia there are enormous areas that have never been surveyed, and some of the State Governments are considering survey of these areas by air, either in conjunction with an air transport company or with machines of their own.

Privately-owned aeroplanes will not be widely used in the Dominions until a transport company can provide facilities to repair them and keep them in running order.

Legislation in Australia.

Proper legislation for the control of civil flying has been passed in some of the Dominions, but Australia is not amongst them, and the difficulty has been due to the State Governments refusing to give the Commonwealth Government authority to put the necessary measures through. This lack of control has already resulted in several fatal accidents, and aeroplanes are being flown and carrying passengers which, under a control as laid down by the International Air Convention, would not be permitted off the ground. The Government, as a whole, is indifferent to aviation, and will not do anything until it is forced to.

From the Defence Department and the Postmaster-General's Department every assistance has been given, and will continue to be given.

Salvage of Wrecks.

Salvage of damaged aircraft presents one of the most difficult problems encountered in a country with an enormous area, small population, and few railways and roads. The entire main railway system of Australia follows the coast line, and there are only a few branch lines penetrating into the interior. The roads follow the railways and so do the telegraph and telephone lines. These circumstances make it essential at present for the air routes to follow more or less the railways, as in case of a forced landing the pilot is near a source of communication and probably assistance.

If the damage is too much to repair on the spot, the only alternative is to strip the machine, have it carted to the nearest railway station and returned to its depot by rail This is expensive, takes a long time, and the machine will certainly receive further damage in transit.

The Dominions are at present indifferently equipped with wireless installations, and it is impossible to say what steps will be taken to make available an adequate wireless tele-

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Telegrams: Martinsyde, Piccy, London.

graph and telephone service. In most cases it will probably be left to the air transport companies.

Fuel and Oil Supplies.

In the majority of the Dominions the price of fuel and lubricating oils is considerably lower than it is here and the supplies are as a rule ample for the local requirements. These facts apply to the capital cities and larger towns. Away from the capitals and larger towns there is frequently difficulty in obtaining supplies. Lubricating oil is sold at 10s. per gallon and aviation spirit at 2s. 6d. per gallon at the seaports, and the prices increase at the rate of 1s. per gallon per 200 miles transported.

Canada, owing to its proximity to the United States oil fields, is excellently situated as regards fuel and oil; Africa is dependent on imported fuel and oil, but successful results have been obtained by the use of a patent fuel made from vegetable matter and known as "Natalite."

Australia and New Zealand are entirely dependent on imports, and although there is oil on the islands north of Australia, no efforts have been made to open up these fields, as the Commonwealth Government will not do so themselves, and will not permit private enterprise to do it Efforts have also been made to procure power alcohol from prickly pear, one of the worst noxious weeds which overrun vast areas of the Northern Continent, but these experiments have been hampered at every turn by the Government.

Although supplies of fuel and oil are available, no arrangements exist for their bulk transport and storage and the air transport companies would have to make their own arrangements.

Spares, Parts and Materials.

Aeroplane parts made in England, shipped to a Dominion south of the Equator and stored there for several months before use, will be found to have deteriorated, and such parts as planes will have warped so badly as to be useless until stripped down, and rebuilt. Dope must be used immediately it arrives from England, otherwise it will be useless. This deterioration of parts can only be overcome by the policy of making the parts on the site or importing them stripped down, and assembling, covering, doping, etc., on the site as required.

The Possibility of Producing Aircraft in Australia.

A study of the difficulties encountered, in Australia, in the building of the complete aeroplane and engine would be interesting. This is, of course, economically impossible, as sufficient demand does not exist to justify the capital expenditure on buildings and plant.

The general situation is, that whilst the whole of the aircraft could be produced, if the demand was sufficiently large, for the probable demand for some years to come the materials will have to be imported. In the meantime a number of the industries which can produce aircraft materials are either being established or extended, and the normal healthy expansion of manufacturing in the country may eventually make the aircraft materials available.

The production of aero engines has been accomplished, in Australia, but is not a commercial proposition. None of the existing engineering shops have the plant to turn out engines on a production basis, and it is estimated that an expenditure of £150,000 on additional plant would be necessary to enable the best equipped shop to undertake aero engine manufacture on a commercial scale. A demand of at least eighty engines per annum would be required to give a reasonable profit on the capital expended. As this demand will not exist for a long time the importation of the engines is the only solution.

In Canada the Canadian Pacific Railway follows the policy of putting in a line to open up new country and bring the settler of the new territory into close touch with his markets. In Australia, where the railways are owned and operated by the Government, the policy is to put in a railway only when the necessary loading is assured. This is a great handicap to the settler and an air service as a forerunner of the railway should prove a commercial success.

The detailed information required to start an air transport service in any of the Dominions can usually be collected in a few months, provided the people carrying out the investigations have an intimate knowledge of the local conditions.

The Discussion.

The Chairman (Mr. A. H. Ashbolt, Agent-General for Tasmania) said that in Australia Mr. Sleeman was doing work in the organisation of air lines which was important to the Empire as a whole, as civil aviation would form the nucleus of the Dominion Air Force. The importance of civil aviation as the basis of a fighting force had been recognised by France and Germany, and we should be foolish if we shut our eyes to the importance thereof. It was necessary for all British Dominion Governments to get together and agree to some standard method of encouraging commercial aviation. He personally thought that the sending of all possible mails by approved aircraft was the most practical method.

Sir Chas. Bright congratulated the author on his interesting and valuable paper. He thought the outlying parts of the Empire offered more scope for commercial flying than Britain. He believed that civil flying should be under the control of the Ministry of Transport, provided that Ministry took over Sir Frederick Sykes for that branch of its activities. The strategic side of aviation was of paramount importance, and national safety must be the first consideration.

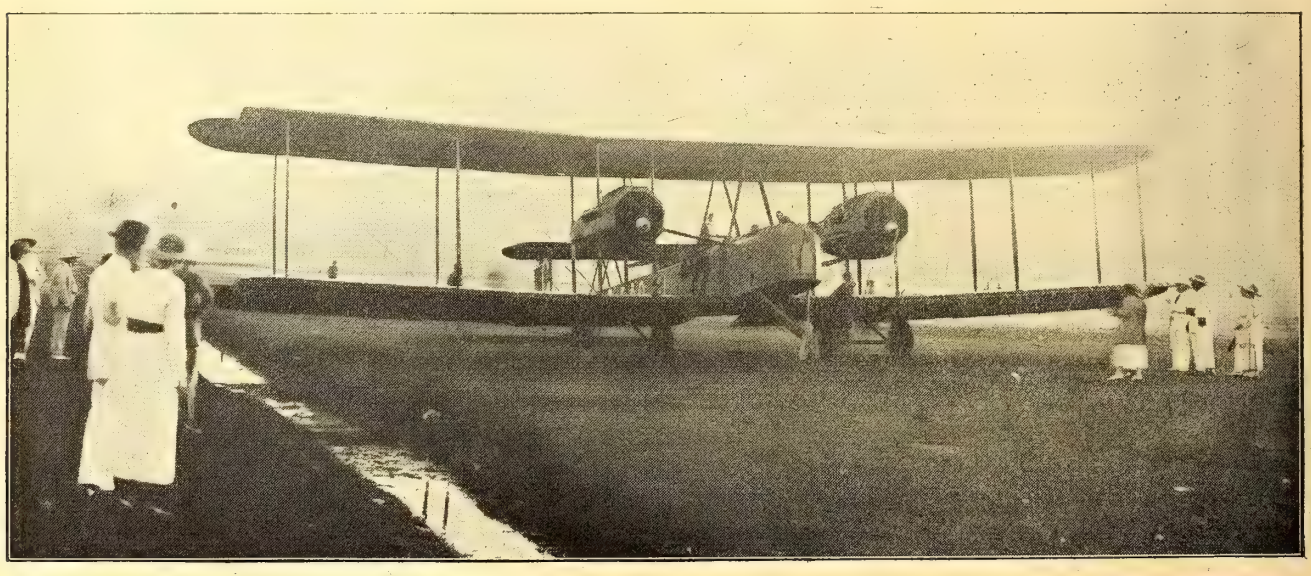
Mr. H. P. Folland said that, speaking as a designer, papers such as Mr. Sleeman's were of great value as giving indication of the special conditions ruling in the Dominions. Hot climates and high elevations would call for designs different from those needed in temperate climes, and more papers giving details of the conditions abroad were wanted.

Dr. Chalmers Mitchell said that he believed the development of commercial flying was the most important problem facing the British Empire. He thought it regrettable that so much stress was laid on accidents, and hoped they would put against the unfortunate accident at Golder's Green the wonderful performance of a machine a few days earlier which came from Paris through two snowstorms and a thick fog.

Col N. T. Belaiew stated that he believed that when the demand arose Australia would be found to be in a position to produce excellent alloy steels for all car and aeroplane purposes.

Mr. A. P. Thurston agreed to the great importance of encouraging flying throughout the Empire. At present, unfortunately, flying was not properly safe and not fully developed. He thought that the future would see enormous changes, wings with hitherto undreamt of qualities, engines entirely different from existing types, and even soaring aeroplanes.

The proceedings terminated with the usual votes of thanks to the author and the chairman.



ON THE WAY TO AUSTRALIA.—Capt. Sir Ross Smith's Vickers "Vimy" (Rolls-Royce Engines) at Singapore. The photograph shows the machine on the Race Course. One is indebted to Mr. Alex. Mosses, of Long Acre, for the photograph, which was sent by Mr. Thomas Sibary, Manager of the Dunlop Rubber Co. (Far East), Ltd., of Singapore.

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Aircraft Engineering, July, 1920

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PIONEERING IN MALAYA.

Captain R. S. Carroll's Nieuport "Nighthawk" at Kuala Lumpur, after landing from the first passenger flight in Malaya.

In The Aeroplane for March 3rd of this year a resumé was given of the work accomplished by a mission sent out to India by the Nieuport and General Aircraft Co., Ltd., under the command of Capt. R. S. Carroll, A.F.C. (late R.A.F.), which accompanied the first commercial aeroplane flight in India on December 21st, 1919, on a Nieuport "Nighthawk" (320-h.p. A.B.C. "Dragonfly").

After a period of three months' flying in and around Bombay, an open invitation was extended to the mission through the Calcutta Press to take the "Nighthawk" to that city. In view of the fact that the machine was not suitable for long cross-country flying owing to the limited petrol capacity, and the lack of suitable landing grounds likely to be found in the 1,200 miles of country that separated Bombay from Calcutta, it was decided not to attempt to fly the distance.

Change of Destination.

After the "Nighthawk" had been dismantled ready to be shipped to Calcutta, an urgent cable was received from Mr. Gordon Wong, of Kuala Lumpur, entreating Capt. Carroll to take his machine to Malaya, as a serious accident had occurred that was likely to do untold damage to the cause of aeronautics.

It appeared that Mr. Wong had, on the conclusion of hostilities, ordered an Avro biplane to be sent out to him so that he could give exhibitions of flying throughout Malaya, but that this machine on its first flight on the Kuala Lumpur racecourse had crashed and killed the pilot, Capt. Pugh, and seriously injured the passenger, Lieut. Farrell. Capt. Carroll thereupon cancelled his arrangements at Calcutta and shipped the "Nighthawk" direct to Singapore.

Capt. Carroll arrived at Penang from Bombay, via Singapore, on April 29th, and arrangements were made to give three exhibitions, the first to take place on May 6th, with flying on the two following days. In preparation for these flights, which were booked to begin at 4.45 p.m. on each day, Capt. Carroll made a test flight on May 5th, taking with him as passenger Capt. Colwill, M.C., who had assisted him and Mr. Wong, of the organising company, in getting the machine ready. The trial flight, which lasted 14 minutes, was a complete success, and created the greatest interest and excitement, many of the streets in various parts of the town being quickly thronged by amazed and admiring people.

Local Description.

The following description of the first test flight is taken from the *Penang Gazette* :—

The "Nighthawk" "took off" beautifully at 4.45 from the far end of the Polo Ground, having shortly before been brought from the temporary hangar. The "Nighthawk," which is a very quick climber, made a wide circle of the Polo Ground, then went in the direction of Ayer Etam and came back over Dato Kramat and Anson Road, and the Racecourse, subsequently proceeding over the town proper, passing over Beach Street well to the south, and going over the foreshore for a distance in the direction of the Province. Returning, the machine passed over the Esplanade area, and was seen by large numbers at the hotels.

It subsequently made a few turns over what appeared to be Simpang Lima, and the many sightseers were then thrilled by a "double roll," providing a suggestion of the "stunt" flying to be witnessed during the exhibition.

After a further short movement, Capt. Carroll made for the landing ground, approaching it from over the trees near the Racecourse buildings, and making an "S" movement to effect a beautiful landing not far from the hangar, amid the cheers of the spectators. The pilot was the recipient of very hearty congratulations on stepping out of the machine.

Capt. Colwill, the passenger, dropped advertising leaflets of Messrs. Huttenbach Bros. and Co., and they were much in demand as mementoes of the first flight over Penang town.

The curious feature of the appearance of the "Nighthawk" was the effect upon the feathered world, the gyrations of the birds large and small in the air, and of excited poultry, creating much amusement. Most of the flying was done at about 1,200 feet, the greatest altitude in the flight over Penang being 2,000 feet.

Capt. Carroll was very pleased with the work of his machine following its journey by steamer from Bombay. He expressed the opinion after the flight that Penang's air was very suitable for flying, and Capt. Colwill ventured the view that "Penang looks fine from aloft." Mr. Gordon Wong was also congratulated on the success of the test.

The First "Stunting" Exhibition in Malaya.

The first exhibition, given on May 6th, was a huge success, and although witnessed by thousands, a very poor percentage paid for admittance to the Polo Ground. Capt. Carroll made an excellent start at 4.53 p.m. from the vicinity of the temporary hangar, and immediately rose to a height of 1,000 feet, and "zoomed" in front of the Grand Stand. This movement was performed by Capt. Carroll after each item of the programme, which included every form of stunting known.

The spectators, unused to the "tricks of the trade" as regards aerobatics, as known to the average student of aviation in this country, were treated to many thrills in the course of the first flight, which lasted almost three-quarters of an hour. The pilot at intervals dropped leaflets advertising Whiteaway, Laidlaw and Co., Ltd. The spectators did not appear to be so enthusiastic as might have been expected. Indeed, amazement seemed to be more in evidence than enthusiasm—a tribute to the pilot and the machine.

Lack of Local Support.

The three exhibitions were all much of a similar nature, although entirely original so far as the Malayans were concerned, and attracting a large amount of interest, the great majority of the people who witnessed the displays were content to remain outside the exhibition grounds, with the result that, financially, the promoters have come off second best.

This was often the case in this country when quite as many people as paid for admission to Hendon were content to remain outside the aerodrome, arguing that the aeroplanes flew in the air, therefore why pay to be allowed on the other side of the fence when all worth seeing could be seen from either side? At that time aviation was considered merely a dangerous hobby for suicidal maniacs, but with the remarkable progress made during and since the war the British public are slowly beginning to take a saner view.

As regards Malaya, it would have been thought that a little more British sportsmanship would have been discovered in a British Possession that has shown such extraordinary patriotism in the past. The support of the enterprise sent to India by the British Nieuport and General Aviation Co., Ltd., would have been but a flea-bite compared with the gift of H.M.S. *Malaya*, a super-Dreadnought of the *Queen Elizabeth* class, costing something like two-and-a-half millions sterling, not to mention sundry aircraft presented by the Federated Malay States through the Aerial League of the British Empire.

Capt. Carroll, as the result of his flying in India and the Far East, contracted a considerable amount of business, apart from doing missionary work in the interests of British aviation. Had it not been for the change of policy of the parent company at home, who chose to suspend active operations at the most critical period, Capt. Carroll would almost

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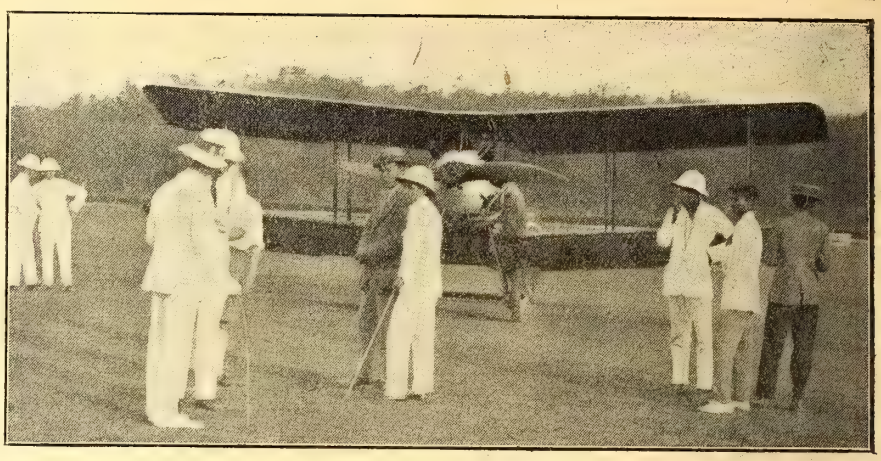
certainly have acquired considerable business, sufficient in any case to justify their continuing to support Capt. Carroll's very hard and thankless task of pioneer work in India and the East.

A European Enthusiast.

At the close of the exhibitions in Penang the machine was bought complete by a Mr. C. F. F. Wearne.

Mr. Wearne has probably done more than anyone in Malaya to further the cause of aviation in general. It was he who gave considerable financial assistance to Lieuts. Parer and Mackintosh, as well as rebuilding their machine. He also carried out extensive repairs to Lieut. G. C. Matthews' "Wallaby," and supplied all the spares to Capt. Ross-Smith. In addition he gave financial assistance in the construction of aerodromes, and he intends at some future date to acquire machines and organise some form of passenger services in the Malay States.



CIVIL AVIATION IN THE MALAYA STATES.—The Nieuport "Nighthawk" at Kuala Lumpur in May, 1920.

After he had purchased the "Nighthawk" an aerial mail was run between Kuala Lumpur and Singapore, the distance of 260 miles being covered in just under two hours. A special message addressed to His Excellency the Governor was dropped just before the machine landed, and other letters, marked "First Aerial Mail," were also duly delivered. The "Nighthawk," which is now in Malaya, bought by Mr. Wearne, for the sake of its historical interest, is the only monument that marks the enterprise and pluck of Capt. Carroll's mission.—L. B.

ENGINE DEVELOPMENTS AND ENGINE INSTALLATIONS.

The meeting of the Royal Aeronautical Society, held on the afternoon of Dec. 16th, was occupied by two papers—one by Mr. H. R. Ricardo on "Possible Lines of Development in Aircraft Engines," the other by Mr. A. J. Rowledge on "The Installation of an Aeroplane Engine."

Possible Lines of Development.

Mr. Ricardo's paper was based on his own extensive researches and explores the thermodynamics of practical engines and the possibilities of improvement in the actual cycle of operation. The actual performance of present engines is so near to the maximum possible from the cycle employed that there is little room for improvement in efficiency by improved detail design.

Detonation and Preignition.

Apart from a fundamental change in the type of cycle used, increase in the ratio of expansion of the working fluid is the only possible method of improving efficiency. In the ordinary type expansion ratio is equal to compression ratio, and therefore the maximum possible compression is desirable. This in practice is limited by the tendency of the fuel to detonate. Detonation leads to preignition—and if detonation can be prevented much higher compressions can be used. With fuels of the light paraffin group—i.e., petrol—the practical limit of compression is about 4.85. Fuels of the aromatic group—benzene, toluene and xylene—are more stable than petrol and cannot be made to detonate even with a compression ratio of 7.5 to 1.

The addition of such aromatic fuels—of which benzol is one—raises the detonation pressure of petrol. Toluene, also a coal-tar product, is even more effective than benzol, and 30 per cent. addition of this fuel to petrol raised the allowable compression ratio from 4.85 to 5.94, with an increase in the possible thermal efficiency from 32.7 per cent. to 36.1 per cent.

Alcohol is an even more effective anti-detonator, but had a serious drawback due to its low heat content per lb.

The higher power obtained from benzol in practice is due to the fact that most existing engines have too high a compression for petrol and need a rich mixture and a retarded ignition to avoid detonation. Benzol allows correct mixture and ignition timing, and the higher power results from this.

The Use of Exhaust Gas.

Another method of raising compression and avoiding detonation is to add exhaust gas to the mixture. This slows the rate of burning down and allows a compression ration of 7.5 with petrol. The compression can be raised in this manner to over 6 without loss of power from a given cylinder and with increased efficiency. The amount of exhaust gas admitted can be reduced as altitude is gained, acting as an altitude adjustment. Regarding safety fuels—paraffin in particular—there were only two possible methods—vaporising and using it in the ordinary engine, and directly injecting it into the cylinder.

Vaporisation requires a temperature of not less than 60 deg. C., and this means 20 per cent. reduction in the weight of charge in the cylinder and therefore in mean pressure, owing to the expansion of the gas. The fuel is unstable and detonates easily, and a compression ratio of about 4.2 to 1 is about the limit, resulting in low efficiency and low M.E.P. Also, the heavier fractions of the paraffin condense and run down the cylinder walls, reach the bearings and wash out the lubricant, with fatal results.

Direct injection involves difficulties of measuring and pumping small quantities of fuel, maintaining correct relations between fuel and air at all loads, and proper pulverisation on injection. These difficulties the author considers serious.

An Alternative to Paraffin.

It is suggested that the heavy aromatic hydrocarbons present in many natural kerosenes might be preferable to paraffin. They are almost completely immune from detonations and so can be used at very high compressions—even when heated to vaporisation. They can be made to give equal power output and higher efficiency than petrol.

Stratified Charging.

Another method of improving efficiency is working with a stratified charge, varying the amount but not the composition of the combustible mixture, and filling up the cylinder with air. This presents difficulties, but can be done. It affords possibilities of very high efficiency, and it reduces the maximum temperature in the cylinder and simplifies the cooling problem enormously.

The possibilities of using a short compression and a long expansion stroke were considered. This gives the efficiency of the high expansion ratio without the troubles of the high compression. This can be achieved in effect by closing the inlet valve late. By altering the timing to more nearly normal as height is gained, the effect is maintained compression and output up to about 15,000 ft.

Super-Compression and Supercharging.

The subject of super-compressed engines was then dealt with, and it was shown that with an engine designed to give full power at 10,000 ft., the engine controlled by injection of exhaust gas would give a higher ground-level output than the late-inlet-valve engine, and a greater output than the throttle-controlled engine.

Supercharging the author considers can better be dealt with by injecting a charge of stratified air than by compressing the whole mixture, and stated that four years ago he obtained very promising results from the system.

In conclusion, Mr. Ricardo said that he thought the difficulties of building large cylinders had been exaggerated. He had designed and the R.A.F. had built a 100-h.p. cylinder. This cylinder had been running on and off for a year. It developed 120 b.h.p. at 1,350 r.p.m. with a compression ratio 4.84 to 1 and gave a fuel consumption of 0.493 lb. per h.p.-hour at 1,250 r.p.m.

The Installation of an Aeroplane Engine.

Mr. Rowledge's paper on engine installation dealt in detail with the points to be considered in designing the installation of an aeroplane engine, and mainly referred to experience with actual installations of the Napier "Lion"—an engine for whose design it is understood Mr. Rowledge was responsible.

The paper though containing little that is novel pointed out what is more or less standard practice in such installations, and must be regarded as a valuable effort by an engine designer to draw from aeroplane designers and pilots

BEARDMORE

AEROPLANES

their own ideas as to what is necessary and desirable. In certain matters, however, Mr. Rowledge expressed his own definite opinions, and these may be briefly summarised here.

Engine-driven petrol pumps should be more reliable than the usual type.

Oil coolers should be fitted with thermometers.

Most carburetter floats are much too small and are thin and flimsy. With an ounce or two of extra weight the float feed can be made to operate at very low heads of petrol and with certainty.

Rubber pipe joints are unsatisfactory.

Moderate gauge steel petrol pipes with rigid joints would probably be an improvement. Carburetter and tank connections will require modification with rigid piping to avoid leakages. Improved fuel gauges are necessary.

Engine controls should be by rods and levers, not by cables. Throttle and altitude controls should be interconnected so that throttling right down brings altitude control to "rich" position to avoid stopping the engine in an attempt to open up. Ignition and throttle controls should be coupled, as this leaves nothing to chance.

Airscrews should be designed to allow full power climbing and getting off. Careful design would secure only a small rise in engine speed if flying level at full throttle.

Removing the radiator from the nose of the machine makes the engine accessible, and if it be smooth (i.e., clean in outline) it need scarcely be cowled in

The paper terminated with descriptions of the installation of Napier engines in the D.H.18, the Fairey amphibian, the Handley Page W.8, the Vickers Viking III, the Westland six-seater, and the Boulton and Paul twin-engined machine.

THE DISCUSSION.

Wing. Comdr. T. R. Cave-Brown-Cave said that the effects of the fuel economy possibilities suggested by Mr. Ricardo were very important. Many people thought the effect of a saving in fuel was confined to the cost of that fuel. But one had in addition the freight on an amount of goods of equal weight, which was much more than the mere cost of fuel.

Col. Wimperis said that the fuel economy at cruising speed was the important factor in aero-engines. Full load economy figures might be misleading.

Air Commodore Brooke-Popham welcomed Mr. Ricardo's paper as evidence that real progress was being made in engine research. Many were under the impression that none was being made and that little was possible. He was struck by the removable engine mounting of the D.H.18, an arrangement such as that allowing changing of engines in a short time was of great military importance.

Mr. A. E. Chorlton said that he had little personal knowledge of engine installation, but he was willing to believe that it was more important than the engine itself. He thought the D.H.18 mounting admirable, and that it should be developed. He had to remark on a point brought out by the recent experience of air traffic, which was that it took a lot of fuel economy—more than was possible—to make up for a heavy engine, except on longer journeys than were usual. In airships the case was different.

Referring to Mr. Ricardo's remarks re stratification, he pointed out that this method of control secured economy at all speeds, including cruising, and that the pilot could not destroy it. The effect of exhaust injection as a preventer of detonation in coke-oven-gas engines was old, but Mr. Ricardo had shown its real value.

Capt. Hill said the Airco 18 engine mounting was admirable. It approached the method of mounting rotary engines in the matter of ease of changing engines. Engine installations had suffered from a lack of co-operation between engine and aeroplane designers, and many engines were absurdly difficult to mount. Engine controls ought to be standardised as to position and arrangement. Petrol tanks which were entirely gravity fed would be a great improvement. His attempts to arrive at engine fuel consumption in flight always gave figures much worse than the makers—instead of under 0.5 lb. per h.p.-hour they were between 0.6 and 0.8 lb.

Col. Bristow said that the design of airscrews required attention. In some cases engines were fitted with airscrews which held them down to 1,500 r.p.m. when the normal speed was 1,900 or so. This meant low power when power was most needed. Steel piping was attacked by benzol, and it was necessary to lead-line it. Magnetos with spark-gap distributors were possible causes of fire and should not be used. One most frequent cause of fire was the breaking of the pipe from an overhead gravity tank to the carburetter. Could Mr. Ricardo hold out hopes of any more simple process of converting the internal energy of fuel than the complicated chain of mechanism of the internal-combustion engine?

The two authors contented themselves with very brief replies to one of two queries, reserving their reply for the Journal of the Society. The proceedings terminated with the usual votes of thanks.

THE INSTITUTION OF AERONAUTICAL ENGINEERS.

[Though the following report concerns a Council Meeting of the Institution held on Nov. 19th, and therefore should have appeared in this paper on Nov. 24th, it has only been received from the Institution in time for this issue. It is hoped, therefore, that the members will not blame this paper for the delay.—Ed.]

Council Meeting.—The Council met on Nov. 19th.

Elections.—Member (Honours Diploma), Dr. A. P. Thurston, A.M.I.Mech.E.

Associate Members.—C. G. Carlisle, Major H. T. Shaw, R. Rhodes.

Life Member (graded as pilot).—The Rt. Hon. Lord Foley.

Associates.—A. M. Langdale, E. R. Gray.

Student.—V. Ernst.

Journal.—The December and subsequent quarterly numbers of the *Journal* will be on sale to non-members of the Institution, at 3s. per copy. The December number contains the full illustrated report of a standard contribution on "The Structure of Steel," which was the subject of a lecture delivered to the Institution by Col. N. T. Belaiew, C.B., in October. This report is accompanied by the discussion. Other features of the December number include an article entitled "Aviation and Empire," by Major H. R. Coningsby, Member, chairman of the Aero Club of South Africa, and notes on "The Helicopter Problem," "The Handley Page Wing," and the "Functions of Technical Societies."

South African Branch.—The Council has agreed to grant a provisional charter for the formation of a South African Branch of the Institution.

Headquarters.—The Council has taken steps which it is hoped will result in the Institution acquiring adequate headquarters in the Westminster district at an early date.

Donations.—The Council desire to acknowledge their thanks to Mr. F. R. Simms for the gift of two framed prints of Henson's aerial steamer and of copies of various periodicals, in addition to those previously acknowledged.

Annual General Meeting.—The annual general meeting was held on Nov. 22nd.

Election of Council.—In addition to the President and Vice-Presidents, who shall remain in office, the following will hold office as Members of Council in 1921:—L. Howard-Flanders, M.I.Ae.E. (Hons.), A.M.I.Mech.E.; W. O. Manning, M.I.Ae.E. (Hons.); H. P. Folland, M.I.Ae.E. (Hons.); T. C. Letcher, A.M.I.N.A., M.I.Ae.E.; Group-Capt. A. M. Longmore, D.S.O., M.I.Ae.E., H. B. Molesworth, M.Inst.C.E.; F. G. Moore, M.A., B.Sc.; Frederick R. Simms, M.I.Mech.E.; H. E. Preston, M.I.Ae.E.; W. Glass, A.M.I.Ae.E.; and Squadron Leader John Sowrey, A.F.C., A.M.I.Ae.E.

Change of Title.—On and from Nov. 22nd, 1920, the name of the Institution became "The Institution of Aeronautical Engineers."

DOUGLAS SHAW, M.I.Ae.E.,
General Secretary.

60, Chancery Lane, London, W.C.2

TRADE NOTES.

THOSE MOTOR LICENCES.

Those whose thoughts are chiefly in, or of, the air, are rather apt to be a trifle casual about mere terrestrial matters. Consequently it is quite likely that a number of readers of this paper, such as officers and men of the R.A.F. and those who are still fortunate enough to be employed in the Aircraft Industry, have omitted even up to this date to secure the regulation holders for the new motor licences. Those who have not yet bought this latest official addition to the expense of living will find that they can get quite the best thing of its kind in the way of licence holders from S. Smith and Sons, Ltd., of 173-175, Great Portland Street, W.1.

These holders are supplied with fittings either to screw on to a car or to clip on to the post of a windscreen or the handlebar or frame of a motor cycle. The price is 7s. 6d. in brass, or 8s. 6d. in nickel.

It is well to note that these must be secured before Jan. 1st.

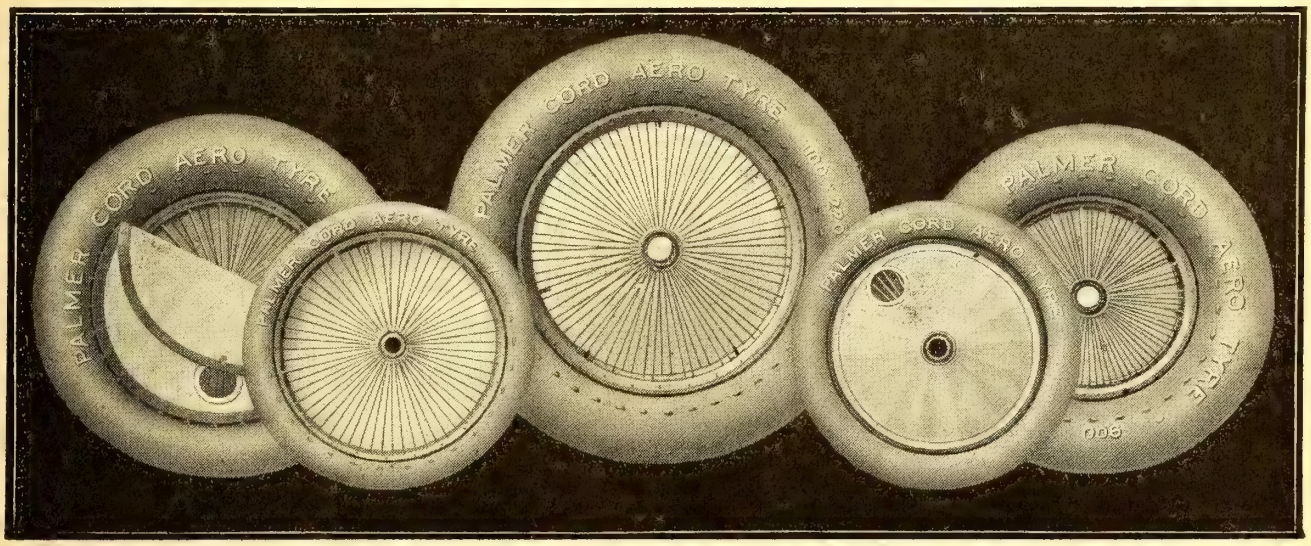
AIRCRAFT PAINTINGS.

There are doubtless many pilots and observers and aeroplane constructors who would like accurate paintings of machines on which they have flown. Mr. Edgar J. March, of Kimberley, Westgate-on-Sea, is prepared to paint any type of aeroplane, seaplane, airship or aerial battle to order. It is only necessary to supply a few details such as squadron and flight markings, number, colour, etc., in order to ensure absolute accuracy.

These paintings make excellent gifts, and will recall in years to come events which are apt to be forgotten. Messrs. Deighton have a large selection of Mr. March's work on view at their shop in Trafalgar Square, W.C., and will be pleased to give any information to anyone interested. The prices are reasonable enough to suit all pockets.

PALMER

LANDING WHEELS & TYRES



STANDARD SIZES

Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line	Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line	Tyre Sizes	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m			m/m	m/m	m/m			m/m	m/m	m/m
300×60	16	111.12	25.4	Central	700×100	77	178.	44.45	132/46	1000×150	141	250.	80.	Central
,,	17	72.39	12.7	Central	,,	92	185.	55.	135/50	,,	201	185.	60.32	125/60
					,,	95	185.	55.	Central	,,	209	185.	55.	Central
450×60	30	89.	31.75	Central	,,	96	178.	55.	132/46	,,	210	185.	60.32	Central
,,	138	130.	38.09	Central	,,	99	178.	38.89	132/46	1000×180	148	220.	80.	Central
					,,	112	150.	38.09	Central	,,	149	185.	55.	Central
575×60	21	160.	28.	Central										
,,	34	150.	31.75	104/46	650×125	119	178.	55.	132/46	900×200	107	185.	55.	Central
,,	111	150.	38.09	104/46						,,	108	185.	55.	125/60
					750×125	77	178.	44.45	132/46	,,	128	220.	66.67	Central
650×65	78	178.	44.45	132/46	,,	92	185.	55.	135/50	,,	137	250.	80.	Central
,,	79	178.	44.45	Central	,,	95	185.	55.	Central	,,	202	185.	60.32	Central
,,	100	178.	38.09	132/46	,,	96	178.	55.	132/46					
,,	101	178.	31.75	132/46	,,	99	178.	38.89	132/46	1100×220	134	220.	66.67	Central
					,,	112	150.	38.09	Central	,,	136	250.	80.	Central
600×75	21	160.	28.	Central										
,,	34	150.	31.75	104/46	800×150	82	185.	55.	135/50					
,,	111	150.	38.09	104/46	,,	85	185.	55.	Central	1250×250	133	250.	80.	Central
					,,	*36	185.	55.	135/50					
700×75	78	178.	44.45	132/46	,,	*40	185.	60.32	135/50	1500×300	115	304.8	101.6	Central
,,	79	178.	44.45	Central						,,	126	304.8	152.4	Central
,,	100	178.	38.09	132/46	1000×150	131	220.	66.67	Central					
,,	101	178.	31.75	132/46	,,	102	185.	55.	125/60	1750×300	139	400.	152.4	Central

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THE AIR SUPPLEMENTARY ESTIMATES.

On Tuesday, Dec. 14th, the Air Supplementary Estimates, 1920-21, was brought before the House of Commons.

Mr. CHURCHILL, introducing the Estimates, pointed out that the Air Ministry had in fact saved money and that no department could stand a more searching challenge or investigation into its expenditure. He pointed out that there was additional expense in Mesopotamia, at Constantinople, where we supplied the Air Force for all the Allied nations, and in Ireland. Also there was an automatic increase in prices and wages and Civil Service salaries. In spite of this the Ministry had saved a million and a half pounds.

Saving had been effected by demobilising officers and men, postponing the training of the R.A.F. reserve, cutting down new material, deferring repairs, revising the programme for building R.A.F. quarters, and stopping long-distance experimental flights. He paid a tribute to the work of Sir Hugh Trenchard and the Marquess of Londonderry who has had charge of the financial arrangements, for having effected these savings.

He said that when the Armistice came the contracts of the Ministry of Munitions for aircraft amounted to £162,000,000 in preparation for a great air effort in 1919. It was as the result of the cancellation of these contracts, which were settled for £85,000,000, that the Air Ministry now had to appeal for further money, this demand for £3,250,000 being transferred to the Air Ministry from the Ministry of Munitions. £23,000,000 had been paid for aero engines in liquidation of contracts.

Sir DONALD MACLEAN, Deputy Leader of the "Wee Frees," tried to turn the debate onto the operations in Mesopotamia. He had, at any rate, the grace to congratulate Air Marshal Trenchard and Lord Londonderry on their economies.

Lieut.-Col. JOHN WARD suggested that some of the derelict army camps on Salisbury Plain could be made useful for the R.A.F. instead of going to the expense of putting up new buildings for the Air Force.

Lieut.-Commander the Hon. J. M. KENWORTHY also worked in complaints about operations in Mesopotamia, Turkey, and Ireland. He hoped that the R.A.F. was in fact replacing a certain proportion of the Navy and Army and thus reducing the expenditure on these Services. He also wanted information about the R.A.F. Territorial Reserve. He advocated building up a reserve from pilots in the commercial air service, happily ignoring the fact that all the pilots of all the commercial air services would scarcely man a full squadron, and that all the mechanics employed on commercial air lines would barely suffice to keep a war flight going. He hoped that the cheeseparings that Mr. Churchill had described had not been made at the expense of the naval wing of the R.A.F.

He referred to the position of civil aviation as "tragical" owing to the dispersal of men and material. He proposed a subsidy for running a commercial airship company, though he said that the airship has only "a transitory usefulness." Also he inquired whether anything was being done for helicopters.

Mr. PEMBERTON BILLING assured Mr. Churchill that whatever demand for money was made by the Government for the furtherance of aviation would receive support. He said that during the war air service administration had been unique in its squandering, unbusinesslike administration and sheer graft. He regretted that more encouragement had not been given after the war, so that surplus aeroplanes and the available pilots could be used for civil aviation. He suggested that the Irish mail could even now be carried more economically by aeroplane than by the Irish mail boats. He reminded the House that a week earlier aeroplanes crossed the Channel when steamboats did not.

He asked many questions about the financial arrangement with the Aircraft Disposal Company, suggesting that the £1,000,000 cash for which the firm bought the disposal material from the Ministry of Munitions was not paid out of the firm's capital, but out of the proceeds of the first sales of material by the firm, which therefore did not use its own money at all. He said that surplus aircraft stock should have been handed out to young pilots forming small adventurous companies instead of being sold to one or two financiers.

He begged Mr. Churchill to bestow his imagination upon aviation in this country instead of on little wars all over the world. He said: "You have two sorts of Press in this country—the technical Press which is read by the minus half of one per cent. of the population and the popular Press which guys aviation so that the ordinary public do not know anything about it and look at it as another 'stunt.' It is not by stunting aviation that we are going to save it from death."

He objected to the destruction of valuable German aeroplanes. He advocated a sound system of aiding civil aviation. He wanted to see the Navy run its own air service, and to see an aeronautical reserve built up of civil aviators.

Mr. CHURCHILL, replying and referring to Mr. Billing, said: "He reproaches me for having too many fish to fry. It is not that I have too many fish to fry, but I have no butter to fry them with." Mr. Churchill said that he hoped in the Estimates next year to make some provision to encourage civil aviation. It would depend on whether the House was prepared to give considerably larger sums to maintain civil aviation.

Sir FREDERICK BANBURY, intervening, said that the deal with the Aircraft Disposal Company had been investigated by the Committee on National Expenditure. If there was anybody to blame it was the Ministry of Munitions, but after investigation the Committee came to the conclusion that there was nothing on which it could report and that there was no ground for taking action.

The sum demanded by Mr. Churchill was duly voted.

NAVAL AND MILITARY AERONAUTICS.

AIR FORCE.

An O/400 Alights in the Sea.

An O/400 Handley Page (J.2259), belonging to the Royal Air Force, had a forced descent in the Irish Sea on Friday, Dec. 17th. The machine was flying from Chester to Ireland via Holyhead, and shortly after leaving the coast engine trouble developed. The crew were taken off by the Elder-Dempster liner *Itajaky*.

The names of the crew were Flying Officer J. J. Williamson, A.F.C., pilot, Flying Officer R. H. Haworth Booth, D.F.C., navigator, Airmen Burrows and Worsley, and the Wireless Operator Airman H. M. Aspen.

An Accident.

On Dec. 18th, Flying Officer E. C. K. Kingston, R.A.F., met with an accident while flying from Leuchars to Gosport. While between Alton and Basingstoke the machine caught fire and fell. Mr. Kingston was taken to hospital in a serious condition, but is making a good recovery. The machine was destroyed.

R.32's Cruise.

On Dec. 13th H.M.A. R.32 left Howden Aerodrome and cruised for some time over Selby and the surrounding district.

A Change of Name.

It is announced that from Jan. 1st, 1921, the title of the Navy and Army Canteen Board organisation will be changed to the Navy, Army and Air Force Institute.

55 Squadron Association.

The Hon. Secretary of the above Association, Mr. Frank Shingleton, very much regrets the necessity for resigning the secretaryship of the Association forthwith as he has accepted a contract abroad in connection with Civil Aviation.

All correspondence must therefore in future be addressed to Sqdn. Leader J. Baldwin, D.S.O., O.B.E. ("Chena," R.A.F. Depot, Uxbridge), who has very kindly consented to take over the secretaryship and treasury pro tem.

War Balloonists' Association.

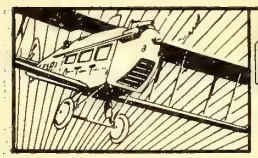
A scheme has been proposed and is now in a fairly advanced stage of realisation for forming a War Balloonists' Association. With a view to forming a temporary committee, a small meeting was called on Wednesday, Dec. 15th, when the following officers were provisionally elected:—Chaiman, E. W. R. Stapley; vice-chairman, A. H. Hall; treasurer, F. W. Beard. Committee: H. B. Chorley, J. W. Crooks, A. Farrar-Hockley, F. W. Corbett, A. Lux, C. W. Epps, P. Norbury, B. Hugh. Mr. S. Buckenham has been appointed secretary, and all who wish to join the Association should apply to him at 148-49, Holborn, E.C.1, or 'phone Museum 4117.

The entrance fee is 5s., as is the annual subscription, and it is proposed to hold the first dinner early in January, at which it is hoped that many ex-balloonatics, both officers and other ranks, will be present. During the period August, 1915-July, 1916, one had the privilege of being sick over the side of a balloon basket on many occasions and was sufficiently fortunate to go overseas with Capt. (now Lt.-Col.) F. H. Cleaver, D.S.O. (known to the world as "Hoppy") in the famous No. 1 K.B.S., and many are the stories which could be told thereof. The remaining officers were: Messrs. V. A. Beaufort, S. C. Raffles, Henry Lygon, and B. May, all since promoted to various and varying altitudes. The band also had the additional help of Major H. R. P. Reynolds and "Father" Lightfoot, but that is all another story. After July, 1916, one returned to aeroplanes.

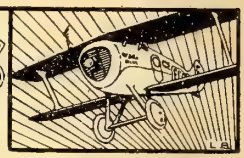
Therefore one wishes the Association every possible success. THE AEROPLANE will always be pleased to print any news of the Association, so that those interested should watch these columns.—G. D.

R.A.F. Fencing.

The R.A.F. beat Tassart's Fencing School in a fencing match at All Soul's Place on Dec. 8th. They won the foil contest by six victories to three, and the épée by nine victories to seven.



COMMERCIAL AERONAUTICS
AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.
OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIRMEN.

No. 136, Dec. 16th, 1920: Pulham (Norfolk)—Flying of Kites and Kite-Balloons—warns pilots that kites and kite-balloons are being flown for meteorological observation

No. 137, Dec. 16th, 1920: Aerodrome List Amendments (374357/20)—Pulham deleted from List B and Northende and Knutsford, Tatley Lane, added to List C.

No. 138, Dec. 17th, 1920: Holland: Regulation Concerning Flying Height—Customs Facilities at De Mok (355042/20).—Aircraft must fly above 1,000 metres.

No. 139, Dec. 18th, 1920: Belgium.—Customs Examination: Aerodromes (355041/20-368608/20).—This cancels Notice to Airmen No. 112.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.T. & T.—Air Transport & Travel, Ltd.; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A. — Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

DECEMBER 13th:

NIL.

DECEMBER 14th:

A.T.T., DH16, G-EAPM, London-Paris, 12.55-15.05, G.&M., 3, Robins.
M.A., Breguet, F-CMAB, Paris-London, 12.34-11.12, 15/12/20, G.&M., Nil, Le Sec.
A.T.T., DH18, G-EAUF, Paris-London, 12.30-13.22, 15/12/20, G., Nil, Armstrong.

DECEMBER 15th:

M.A., Breguet, F-CMAC, London-Paris, 12.30-15.17, Nil, 1, Martel.
A.T.T., DH16, G-EASW, London-Paris, 13.08-15.50, G., 3, Lines.
M.A., Breguet, F-CMAG, London-Paris, 13.20-16.15, G., 2, Challoux.
M.A., Breguet, F-CMAB, London-Paris, 13.22-16.10, G., Nil, Le Sec.
A.T.T., DH16, G-EAPM, Paris-London, 12.35-15.00, G.&M., 1, Robins.

DECEMBER 16th:

A.T.T., DH16, G-EASW, Paris-London, 12.50 St. Inglevert, G., 2, Lines.
M.A., Breguet, F-CMAI, Paris-London, 13.00 St. Inglevert, G., Nil, Martel.

DECEMBER 17th:

NIL.

DECEMBER 18th:

NIL.

DECEMBER 19th:

NIL.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

DECEMBER 13th:

H.P.T., 0/400, G-EAMA, Paris-London, 12.30-16.09, G., 2, McIntosh & 1.

DECEMBER 14th:

NIL.

DECEMBER 15th:

NIL.

DECEMBER 16th:

NIL.

DECEMBER 17th:

NIL.

DECEMBER 18th:

NIL.

DECEMBER 19th:

NIL.

Air Port Statistics.

CONTINENTAL

MACHINES:	Croydon	10	Cricklewood 1	Total 11
PERSONNEL.—Passengers:	Croydon	12	Cricklewood 2	Total 14
Crews:	Croydon	10	Cricklewood 2	Total 12
				Total Personnel 26

Inland Flying at Croydon.

Dec. 13th & 14th.—Nil.
Dec. 15th.—L.A.S., Avro, Leatherhead return (Muir); C.T., Salmson, 1 test (Mauler).
Dec. 16th-19th.—Nil.

Inland Flying at Cricklewood.

Dec. 13th.—Nil.
Dec. 14th.—H.P.T., 0/400 starting to Paris but crashed (Bager).
Dec. 15th.—H.P.T., DH4a from Croydon (Foot).
Dec. 16th.—Nil.
Dec. 17th.—H.P.T., DH4a test (Foot).
Dec. 18th & 19th.—Nil.

The London Terminal Aerodrome.

The tragedy of the year is the closing down of Aircraft Transport and Travel, Ltd., and the consequent withdrawal of those excellent commercial machines, the D.H.16 and D.H.18, from the Paris service. There is still hope that the machines and pilots may start up again under different financial interests, and it is quite unthinkable that this splendid group can be dispersed.

Meanwhile the French are still running regularly to Croydon, interspersed with an occasional British machine such as the Instone Vickers "Vimy," which made a successful trip to Paris on Monday this week. A "16" belonging to the remains of A.T. and T. also arrived from St. Inglevert, where it has been since the 16th inst.

Young M. Mauler, the French Nieuport pilot who had such a bad crash at Lympne in March last, was testing the Salmson F-CMAN which has been waiting for spares for several months at Croydon.

Mr. Muir, of Leatherhead Aviation Services, was flying on the Avro on Wednesday.

On Jan. 7th there is to be a smoking concert at the Aerodrome, which has been organised by the staff. The programme is being arranged by Mr. Thompson.

One would like to take this opportunity of thanking everyone at the Aerodrome for the way they have helped this paper to obtain its weekly news, and the way they have all put up with the insults which have been hurled at nearly everyone's head from time to time, and one hopes that those few who really have taken offence at remarks that have been made, and there are one or two, will at this season forgive one. To everyone one wishes a happy Christmas, and one hopes that Civil Aviation will have a bright and prosperous New Year. And finally may it be only "Au revoir," and not "Farewell" to the personnel of A. T. and T.—C. D.

No Air Mails at Christmas.

The P.M.G. announces that no air mails will be dispatched from London to Paris and Brussels from Saturday, Dec. 25th, to Tuesday, Dec. 28th, inclusive.

Beardmore

The Power Unit for the Air Liner

The use of the aerop'ane for commercial transport and passenger service calls for the most efficient and trustworthy power units available.

Beardmore engine reliability has been the cause of great enthusiasm from the earliest days of flight, and proof of their popularity to-day is evidenced by the fact that manufacturers are largely specifying Beardmore as standard post-war power units. Beardmore engines have gained the confidence of manufacturers and passengers alike.

We co-operate to give speedy delivery and complete engines with all duplicate parts are despatched within 24 hours. Every engine guaranteed.

Beardmore Pleasure Cars & Commercial Vehicles.

"A Car for every purpose."

The flattering reception of the Beardmore models at both the Commercial and Pleasure Car Shows was most encouraging. Beardmore reputation is once again worthily upheld, and we cordially invite the inspection of the wide range of models on view at our showrooms.

BEARDMORE AERO ENGINES, Ltd.
112, Great Portland St., London, W.1.
Telephone—328 Gerrard.
Works - Parkhead Steel Works, Glasgow.

AeroEngines

Dogs by Air.

Mr. J. F. C. Ogle, of Newcastle, was fined £20 at Croydon on Saturday for bringing a dog by air from the Continent.

Bringing dogs by air from France to England was turned into a fine art during the late lamented intertribal campaign, since brought to an untimely conclusion.—G. D.

A Correction.

Last week one hazarded the opinion that Mr. R. H. MacIntosh is a Scotsman. He now informs one that this is a mistake and he is a Scot by absorption only.—G. D.

Capt. Ward's Accident.

The accident to Capt. Ward, of the Beardmore Air Line, which occurred last week, was fortunately without serious consequences. He landed at Portholme in ten inches of snow and the machine turned over and was a complete "write off." Capt. Ward come into contact with the watch-case, the catch of which broke and allowed the cover to open, and cut his nose. One does not recommend this method of "taking the time" at the termination of a flight. After dissociating himself from the horlogerie Capt. Ward went into the town to obtain the necessary palliatives and came up to London later in the day.—G. D.

The Accident to the Handley Page.

As briefly reported in THE AEROPLANE last week, a serious accident occurred to an 0/400 Handley Page G-EAMA on Tuesday, Dec. 14th. The machine had on board the pilot, Mr. R. Bager, and his mechanic, Mr. J. H. Williams, together with six passengers, and a load of freight. She was starting on the usual trip to Paris and took off parallel with the works in an easterly direction. She struck a tree about 50 feet in height, the base of which, according to the ordnance map, produced at the inquest, was some 25 feet above the part of the aerodrome from which the machine started and some 600 yards distant. Beyond the tree were some houses, one of which was struck by the machine, which then hit the ground, where it immediately burst into flames.

Mr. Bager and Mr. Williams, as well as two of the passengers named Salinger and Van der Elst, lost their lives. Three of the others made their escape by breaking through the mica windows. The fourth, Mr. Eric Studd, who was in the nose of the machine, was flung out and escaped with a few bruises.

At the inquest held at Hendon on the 16th inst. the coroner recorded a verdict that the deceased died from the consequence of burns caused by fire due to the crashing of the aeroplane to the ground after striking a tree. Sufficient evidence was not forthcoming for him to determine the cause of the disaster.

Major H. G. Brackley gave evidence to the effect that he was responsible for the despatch of the machine, which appeared to be in perfect order. It was licensed in September, 1919, and in June, 1920, went into the shops for overhaul, whence it emerged on Nov. 2nd, 1920. He said that when he tested it it was as good as new.

A passenger, in giving evidence, said that the machine did not appear to get clear of the ground in the normal way. The evidence shows that towards the east the ground slopes up quite steeply, and the top of the tree which was struck was some 75 feet above the starting-point of the aeroplane. Beyond the tree are houses and a thickly-populated district. This is the case on two sides of the aerodrome. On the fourth is the Midland Railway goods yard.

This is the first fatal accident to a Handley Page machine engaged in Civil Aviation. Handley Page Transport, Limited, have up to now carried over 4,000 passengers and many tons of freight, and a total mileage of 320,000 miles have been covered. It is difficult to mention any other method of transport with so fine a record. On the regular air lines almost a million miles have been covered up to date with but one other accident.

It should be noted in connection with the accident to the Centaur 2a, regrettable as it was, that this machine was only of an experimental type and was being used on test, so that accident cannot be fairly included in the regular air line figures.

Mr. Robert Bager was at one time an N.C.O. pilot of the Royal Air Force, and formerly R.N.A.S. he had been in the employ of Handley Page Transport, Ltd., almost since the firm came into existence. He was the first pilot to fly the W8, which machine he flew on its first trip to Paris for the Aero Show last year. He had a bad crash when flying as a passenger in a Bristol at Waddon early this year, and had the misfortune to "write off" an 0/400 in a fog near Beauvais about a month ago. He was the "skipper" and Mr. Williams the "first mate" of the ill-fated G-EAMA in the amusing letter which appeared in THE AEROPLANE dated Dec. 1st, entitled "Direction Finding as Done."

Robert Bager and J. H. Williams were immensely popular with everybody who worked with them. They were a most cheery pair and full of humourous ideas, as the letter referred to showed. Each was thoroughly competent at his own job, and that fact makes their accident all the more mysterious.

One is informed that there is a rip panel in the ceiling of the cabin of the 0/400 passenger machines whereby the occupants can make their escape in such a case as this. It seems either that one of these was not fitted in this particular machine or that the passengers did not know of its existence. Readers of this paper may remember that in the accident to the D.H.18 the occupants were able to get out speedily through the two large manholes in the cabin of the machine.

Everyone will offer their sympathy to the relatives of the deceased and to Mr. Handley Page and all the Handley Page Transport people on this occurrence.—G. D.

"Quex" and the "Lion."

The following letter has been addressed to the *Evening News* but has not yet appeared therein :—

Sir,—With reference to the notes written by "Quex" in last night's *Evening News*, page —, "Diary of a Man About Town," and the question of Aero Engines, wherein he expresses the hope that the Government will take up the matter of Aero Engines, so far as the Napier Aero Engine is concerned its reliability has been proved in no uncertain manner during the past few months in the following ways.

The Napier aero engine was the only engine which came through the British Government Aircraft Competitions with flying colours, inasmuch as the machines which were awarded the highest prizes and highest marks in each of the three classes of these competitions were fitted with the 450-h.p. Napier engine.

Since then the Napier has been put to a further thorough and strenuous Government Type Test of 50 hours' duration, without any trouble throughout. Having completed this test, it was put to a further five hours' test of even a more strenuous character, as will be gathered from the following figures :

1 hour at 450 h.p., 2,000 r.p.m.
1 hour at 350 h.p., 2,310 r.p.m.
1 hour at 450 h.p., 2,100 r.p.m.
1 hour at 529 h.p., 2,150 r.p.m.
1 hour full throttle, 490 h.p., 2,000 r.p.m.

We trust this information will be of interest to your correspondent, and that from this he will be able to assure your readers of the reliability of the Napier aero engine, whatever he may have said about other types.

(Sgd.) H. T. VANE (Man. Dir., D. Napier and Son, Ltd.).

THE BRITISH DOMINIONS BEYOND THE SEAS.

CANADA.

Oil Rush by Aeroplane.

It has been reported in the *Financial News* that Alberta is preparing for a rush by aeroplane to the new petroleum fields near Fort Norman, on the MacKenzie River, 900 miles north of Edmonton, which has been heralded by the Dominion surveyors to be richer than the oil lands of California.

Negotiations are already under way for the establishment of an aerial service out of Edmonton, with landing stages along the route, supplied with food and fuel for prospectors and their machines.

SOUTH AFRICA.

A Proposed Aerial Service.

According to the *Motor Weekly*, of Bloemfontein, a scheme for an air service to embrace the whole of the Union of South Africa has so far progressed that a company is at present in course of registration in London. It is proposed to carry passengers, mails and freight, although the original scheme was to carry mails and parcels only.

It is reported that D.H.16s will be used, although in making this statement it is mentioned that they will carry 16 passengers or 2½ tons of goods. As the D.H.16, as used by A.T. and T., Ltd., on their Continental services, only carries four passengers and a proportionate amount of freight, it cannot be certain as to what machines will eventually be used.

Capt. Victor Kelly was supposed to have left England towards the end of October with the first consignment of machines, but it is quite possible, if Airco machines were intended to have been used, that these arrangements have since been altered.

Col. R. de Sarigny, who is in charge of operations in Johannesburg, is reported to have said that the company has secured provisional contracts with every firm of standing in the city of Johannesburg, and that the Chamber of Commerce has expressed its recognition of the need of a fast parcels' traffic for the purpose of delivery to country centres and bringing goods urgently needed by Johannesburg establishments from the coast.

The journey to Durban from Johannesburg will be done in four hours and the return fare will be about £10.

FOREIGN INTELLIGENCE.

FRANCE.

A French correspondent of THE AEROPLANE writes :—

French Aeronautical Propaganda.

M. E. P. Flandin, Under Secretary of State for Aeronatuics, since his arrival at Avenue Rapp, is studying the means of propaganda which would be useful to spread in France the inclination for aviation, and to give abroad an exact idea of what they have realised.

With the Aero Club of France it will be for their big association to work inland and occupy itself with the help of its aeronautical attachés some propaganda abroad.

This propaganda would comprise the Rhine representation, extension of international aerial postal services, lectures, exhibitions, etc.

On the other hand, Mr. Imbrecq, member of the Committee of the Aero Club of France, has submitted to M. A. Michelin, President of the Aero Club, the following :

M. Imbrecq suggests for every soldier of every arm, the obligation to make, as passenger, at least a flight of about ten minutes. Many of these men would so take a liking for aviation, and all of them, at any rate, would tell of their performances to their parents and friends, that all this would constitute a propaganda for aerial navigation. M. Imbrecq says, further, that it would also be, for reserve airmen, a good oportunity to maintain their training, in giving the air baptism to young recruits.

A Memorial to French Aviators.

Under the instigation of Mr. Flandin, Under Secretary of State for Aeronautics, and of Captain Fonck, the French Ace, Deputé of the Vosges, the Committee of Direction of the Aero Club of France, at its last meeting, decided to open a subscription for the erection of a monument to the glory of French aeronautics and its heroes, dead for their country.

The French Aero Club has opened the subscription with 50,000 francs.

On the other hand, a memorial for the aviators dead for their country has been bought by the French State, and will be erected in Les Invalides.—E. H. L.

GERMANY.

A correspondent of THE AEROPLANE in Berlin writes :—

Aircraft Material Discovered.

Remarkable news comes to hand from Detmold, dated Dec. 15th. It would appear that in a wood near Salzuflen parts of an aeroplane park valued at a million marks has been discovered, apparently hidden there for the purpose of illegal trading and profiteering. Several Herford firms are involved in the matter, as they attempted to transport the material at the dead of night.

In the meantime the Federal Minister of Finance, who had been notified, came down on the evil-doers like the proverbial ton of bricks and confiscated everything traceable.

Among other finds eight chests with aeroplane engines and airscrews were discovered, together with a large amount of German army material, which should have been destroyed at the Entente bidding, but which, owing to some leakage, was got away for purposes of money-making.—S B.

ROUMANIA.

French Aeroplanes for Roumania.

It has been reported from Bucharest that, as the result of negotiations that have been taking place between the French and Roumanian Ministries of War, an agreement has been arrived at whereby France will deliver to Roumania aeroplanes and an important quantity of aviation material.

Roumania will, in return, permit a large amount of petrol and petroleum to be exported to France.

New York-Nome Flight.

The return flight from Alaska to New York has been distinctly disappointing. The whole formation made a good showing in getting there on the outbound journey, but homeward bound there seems to be a lack of enthusiasm and the formation is scattered all along the route. Some seem to have crashed to avoid too early a return to God's Own Country in its bone-dry dejection (synonym for lack of spirits!).

There is a rumour that the leading machine had on board an Alaskan husky or sleigh-dog. What he will think of Broadway after the charms of Nome, Alaska, is a matter for speculation.—L. M.

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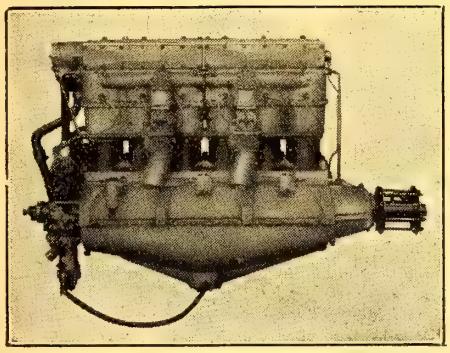

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AIRCRAFT IN PARLIAMENT

Nov. 30th.—The following written answers were given:—

ROYAL AIR FORCE.—EXPENDITURE.

Mr. CHURCHILL, in reply to Mr. Lawson, asked if, in view of the depleted staff available, that Member would not press the question of the total expenditure on the R.A.F. in each theatre of war, including Ireland and at Home.

In reply to Mr. Glanville, Mr. CHURCHILL said the estimated monthly rate of expenditure on the R.A.F. in Ireland is £37,000. Of this amount, £8,700 represents additional expenditure due to the existing conditions in Ireland

CADET COLLEGE, CRANWELL.

In reply to Mr. D. Herbert, Mr. CHURCHILL stated that it had been decided that more satisfactory and economical results would be got by entrusting the building of the R.A.F. Cadet College at Cranwell to the Office of Works than by entrusting it to a private firm.

* * *

Dec. 2nd.—The following written answers were given:—

ROYAL AIR FORCE.—PROMOTION

Sir W. JOYNSON-HICKS asked the Secretary of State for Air whether under the new Regulations for the promotion from flying officer to flight lieutenant a man aged 22, with five years' service, mostly at the Front, is to wait another two years for his promotion, while a man of three years' service, of which only one year would be at the Front, can be and is promoted flight lieutenant merely because he is 25; and whether he is aware that this rule is creating serious discontent amongst the younger and most gallant members of the Force.

Mr. CHURCHILL: It was found essential, for the sake of uniformity of practice in the Air Force, to give Air Officers Commanding some guidance in making periodical recommendations for promotion. This was done by means of personal letters to those officers, of which my hon. friend appears to have heard. He has, however, misconstrued the particular direction to which he refers. I should deprecate detailed discussion of the matter, but I might explain that no one will be promoted to flight lieutenant merely because he is 25 years of age. That age was given as a normal minimum for promotion to the rank, but permission was also given to recommend younger officers whose exceptional service warrants this course. All promotion is by selection, and war-service records are fully considered. There is, therefore, no occasion to fear the anomalies which my hon. friend imagines.

TRANSFERS.

Mr. CHURCHILL, in reply to Sir Ivor Phillip, said: Men who enlisted in the Royal Naval Air Service for a period of 12 years' service, and who were subsequently transferred to the Royal Air Force, are held to their 12 years' engagement under Section 3 (1) of the Air Force Constitution Act, 1917. The limitation of service to the period of war or to a period not exceeding 4 years applies only to personnel attached to the Air Force, and not to personnel transferred.

* * *

Dec. 15th.—The following written answer was given:—

AIRCRAFT-CARRIERS.

Sir J. CRAIG, in reply to Mr. Briant, said that the numbers of aircraft-carriers in full commission, in commission in reserve, and paid off are shown on pages 701 to 714 of the Navy List. The number scrapped since the Armistice, i.e., sold for breaking-up purposes or otherwise, is four. The number in course of completion is two.

* * *

Dec. 16th.—The following written answer was given:—

R.A.F.—UNIFORMS

In reply to Mr. Hohler Mr. CHURCHILL said that an officer who joined the Royal Naval Air Service and who was subsequently transferred to the Royal Air Force has had to provide himself with Royal Naval Air service uniform; Royal Air Force service dress; Royal Air Force mess dress.

The cost of the Royal Naval Air Service uniform was, approximately, £20. The Royal Air Force service dress and mess dress cost, approximately, £25 and £23, respectively. The Royal Air Force service dress was changed from khaki to light blue, and from light blue to a darker blue, but officers were not bound to purchase any uniform of the new colour until their existing uniform required renewal.

Officers granted permanent Royal Air Force commissions, those granted short service commissions and officers promoted from the ranks who are retained in the Royal Air Force for a definite period have been instructed to provide themselves with mess dress. The approximate cost is £23. No allowance is made to officers to cover this expense.

ROYAL AIR FORCE—AERO ENGINES.

Mr. CHURCHILL, in reply to Mr. Raper, said that no new British or Allied aero engines had been intentionally destroyed by order of the Air Ministry since the Armistice.

In reply to an interjection from Mr. Billing, Mr. CHURCHILL added: "It is quite true that a number of aeroplanes accumulated during the latter part of the War have been reduced to their component parts, and I expect that we should have been very much complained of if great expense had been incurred on a large staff in keeping these machines in order."

Mr. CHURCHILL, in reply to further questions from Mr. Billing and Mr. Raper, said that the recent delivery of aeroplanes similar to those destroyed was part of the general settlement of contracts. It had been necessary, since the Armistice, to take delivery of 14,800 engines ordered before that time as the contracts could not be cancelled. These engines were of 28 different types and varied greatly in price.

* * *

Dec. 17th.—The following written answer was given:—

R.A.F. (UNIFORM ALLOWANCE).

Mr. CHURCHILL, in reply to Mr. Hohler, said: As regards Army officers, an allowance of £150 will be made subject to certain conditions to officers joining the Household troops. For officers joining other regiments in which full dress is not worn, the rate will be £50, subject to conditions about to be announced. The question of an allowance for uniform in the case of officers of the Royal Air Force is under consideration, and it is hoped that an announcement on the subject will shortly be made.

* * *

The following is taken from the *Times* of Dec. 21st:—

Dec. 20th.—THE AIR NAVIGATION BILL.

This Bill, as amended, was considered.

Mr. CHURCHILL moved the following clause, which had been deleted from the Bill in Committee:—"This Act shall not apply to aircraft belonging to or exclusively employed in the service of His Majesty, provided that His Majesty may by Order in Council apply to any such aircraft with or without modification any of the provisions of this Act or of any order or regulations made thereunder. Nothing in this Act or in any order or regulations thereunder shall prejudice or affect the rights, powers, or privileges of any general or local lighthouse authority." He explained that there was every intention of making the control of the Royal Air Force as strict in every respect as was provided in the Bill, but it was not correct to bring a military body serving under the direct authority of the Crown within the ambit of a civil measure. It would be out of harmony with the whole spirit of our legislation to challenge the principle of Crown exemption, and to place the force under the regulations which were embodied in a Bill dealing with civil aviation.

The clause was read a second time and added to the Bill.

Lieut.-Comdr. KENWORTHY moved an amendment to enable municipalities to establish aerodromes and run their own air services.

Mr. CHURCHILL said no municipality he knew of desired to have such powers. It would be overweighting the Bill to confer upon them the power to run a local air fleet out of the rates. He could not accept the amendment.

The amendment was negatived, and the Bill was afterwards read a third time.

Mr. CHURCHILL stated, late on the night of Dec. 20th, that the present position of civil aviation was causing the Government real anxiety, and he hoped to be in a position next year to announce a new Government policy which would give assistance to civil aviation in a new form, and would, he trusted, help it through the difficult years before it came into its own.

THE ROYAL AERONAUTICAL SOCIETY.

TRANSACTIONS.

A new volume in the "Transactions of the Royal Aeronautical Society" has just been published and may be obtained at the Society's Offices, price 5s. It embodies a paper on "Aero-Engine Efficiencies," by Dr. A. H. Gibson, of Manchester University, which contains a large amount of important experimental data on the thermal efficiency of internal-combustion engines.

SCOTTISH BRANCH.

The members of the Scottish Branch, through the courtesy of Sir William Beardmore, Ltd., recently visited this firm's works at Inchinnan, when they were given an opportunity of examining the new rigid airship, "R.36," which is in process of construction for the Government.

NEW YEAR OUTING.

It is hoped to arrange early in the New Year for a number of members to visit an important centre of aeronautical experimental work. Further details will be announced later.

DONATIONS.

The Council desire gratefully to acknowledge the gift of "Rigging, the Erection and Trueing-up of Aeroplanes," by F. W. Halliwell, the author, and also the gift of lantern slides from Messrs. The Bristol Aeroplane Company.

LIBRARY.

The following books have been received and placed in the Society's Library:—"Soaring Flight," by Lt.-Col. R. de Villamil; "Report of the Lubricants and Lubrication Inquiry Committee"; "Smithsonian Physical Tables," by Frederick E. Fowle.

W. LOCKWOOD MARSH,
Secretary

Dec. 17th, 1920.

THE ROYAL AERO CLUB.

MEETING OF JOINT STANDING COMMITTEE OF THE ROYAL AERO CLUB AND THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS.

A meeting of the Joint Standing Committee of the Royal Aero Club and the Society of British Aircraft Constructors was held on Thursday, November 25th, 1920, when there were present:—

Royal Aero Club:—Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., in the chair; Brig.-Gen Sir Capel Holden, K.C.B., F.R.S.

Society of British Aircraft Constructors:—Capt. P. D. Acland; Commander James Bird; Mr. Alan E. L. Chorlton; Mr. Charles V. Allen (secretary, Society of British Aircraft Constructors).

Racing Committee of Royal Aero Club:—Major-Gen. Sir Sefton Brancker, K.C.B.; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F.

Harold E. Perrin, secretary.

Programme of Racing, 1921.—A discussion took place as to the Racing Events for 1921, and a suggested programme was drawn up for submission to the Committee of the Club.

International Races.—It was decided that representatives of the Society of British Aircraft Constructors should meet the Racing Committee of the Club on Nov. 29th, 1920, to put forward their recommendations as to the conditions for the Schneider Race, 1921, for seaplanes and for the proposed International Speed Race for flying machines.

Classification of Machines for Racing Purposes.—It was decided to defer this for the present.

FLYING SERVICES FUND COMMITTEE.

A meeting of the Flying Services Fund Committee was held on Friday, Nov. 26th, 1920, when there were present: Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the chair; Lieut.-Col. Alan S. W. Dore, D.S.O.; Mr. Chester Fox; and the Secretary.

Applications for Assistance.—Forty-four applications for assistance were considered and grants and allowances voted amounting to £625 11s. 3d.

COMING EVENTS.

JANUARY—1921

1st, Sat.—No. 41 Squadron's Dinner at Oddenino's. Particulars from Flight Lt. K. C. Leask, Hillingdon House, Uxbridge.

20th, Thurs.—R.Ae.S. lecture. "The Cost of Air-Ton Miles Compared with other forms of Transport," by Lord Montagu of Beaulieu.*

21st, Fri.—No. 100 Sqdn. Dinner. Particulars from Comdr. Christie, Room 569, Air Ministry.

FEBRUARY—1921.

3rd, Thurs.—R.Ae.S lecture. "Meteorology and Aviation," by G. Dobson. "Ground Engineering," by Wing Cdr H. W. S. Outram.*

17th, Thurs.—R.Ae.S. lecture. "The Handley Page Wing," by F. Handley Page.*

* All the Royal Aeronautical Society's lectures will be given in the theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m.

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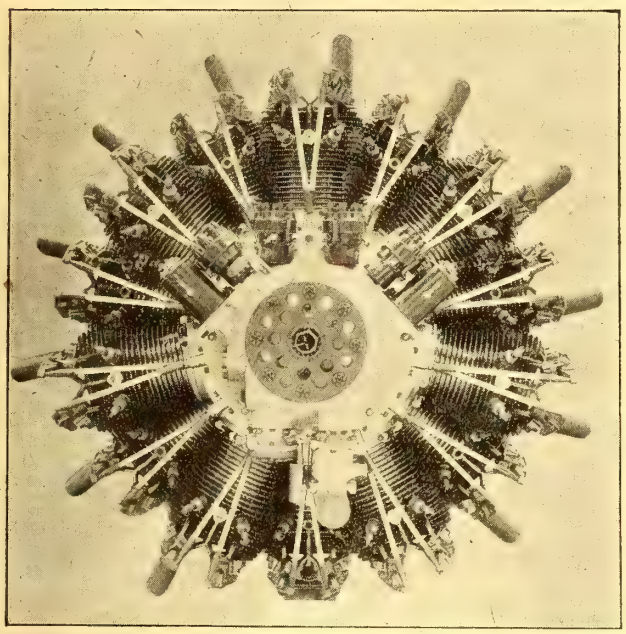

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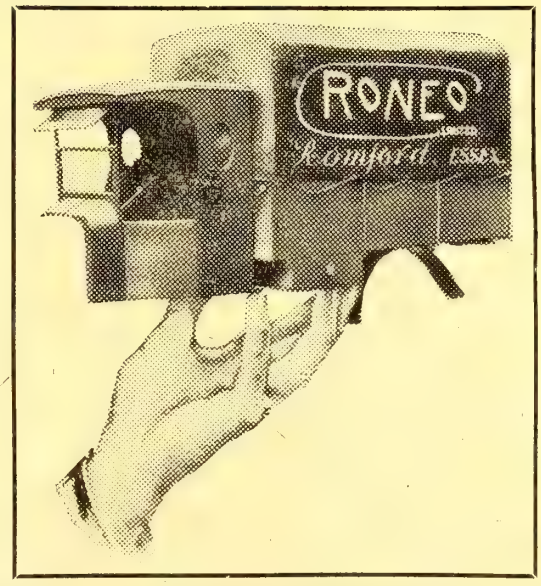

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ON THE MONTROSE GHOST.

This being the period of Christmas Holidays, unfortunately enforced holidays for many who would willingly work, and Christmas being traditionally the time when ghosts do most frequently walk, or are most frequently the subject of tales of horror, it seems apposite that the story of the R.F.C.'s own particular ghost should now be told, seeing that four years have passed since his appearance.

Many people in the R.F.C. and a few in the R.N.A.S. have heard of the Montrose Ghost, but none, so far as I have been able to discover, have found any reasonable explanation of the appearance of the said ghost Naturally most people regarded the story merely as an ingenious invention. Others, who knew more of the facts, talked of hallucinations, mental fatigue, war nerves, and such physiological or psychological phenomena. Only two of those with whom I discussed the affair, and those two very eminent doctors, admitted that though they did not believe in ghosts they had met with so many curious phenomena that they were not by any means prepared to deny the existence of ghosts. Therefore it seems well to give a perfectly natural and eminently practical reason for the ghost's visit to Montrose.

As the story of the ghost circulated in the R.F.C. it became somewhat embroidered with circumstantial evidence, so perhaps my version may not be so impressive as that which some readers of this paper have heard. But what is set forth hereafter is essentially what was gathered by various people who investigated the case very carefully. It is a long time since I heard the facts discovered by these investigations, and I have to trust to my memory for the details. I am fairly sure that these details are correct, and I know that, though I have no head for figures, such dates as I give are accurate, but to avoid inaccuracy I have given periods of time rather than actual dates of days, where I am not certain. Naturally, I cannot give the names of the chief witnesses in the case, as they are all still alive and might not like to become public characters. Howbeit, here is the story as it came to me with evidence which would have satisfied any court of law.

How the Ghost Appeared.

Let it be remembered that Montrose is one of the oldest aerodromes in Great Britain It was established late in 1912 or early in 1913, as a base from which to watch the North Sea and from which to co-operate with the Fleet either in the Forth or at Cromarty. In those days the R.F.C. consisted of a Naval and Military Wing. The aerodrome was laid out by No. 2 Squadron, R.F.C., then commanded by Major Burke, who was afterwards killed commanding an infantry battalion in the war, and in the squadron were Captain Becke, Lieut. Longcroft, Lieut. Waldron, and others whose names afterwards became famous in the R.F.C.

During the war Montrose became a training aerodrome and a quantity of building was done there. At the time when the ghost appeared the pupils—or "Huns" as they were called by the older R.F.C. people, on account of their brutality to their aeroplanes—lived in a grand New Mess which had been built for their benefit. The Staff, that is to say the O.C., and Instructors lived in the Old Mess, an elderly but not ancient house which had been No. 2 Squadron's Mess.

One evening in the autumn of 1916, an officer of the Staff who had been working late at the aerodrome was walking up the path to the Old Mess in the dark when he saw an officer in flying kit walking in front of him. It was too dark to recognise him. The man in front went up to the door but did not open it. The second officer reached the door and to his surprise the man in front was not there.

Though it was dark there was quite enough light to see a man's figure some yards away, and it was certain that the man in front had not stepped off the path to either side. Yet he was not on the doorstep when the second man reached it. Naturally the officer concerned was somewhat surprised, but put the affair down to eye-strain or imagination. Nevertheless, he was very sure, in his inner consciousness, that he had seen somebody.

He tried to forget this strange meeting, but some evenings later, just when he was beginning to think that he had been mistaken, he saw the mysterious figure again. And again when he had reached the spot at which he had seen it halt, it was not.

If my memory of the evidence is correct, he saw the figure four or five times and became seriously worried. Being a good soldier he wanted to get on with his job and did not want to be invalided on account of nerves or hallucinations, so wisely, or unwisely, he kept his mouth shut and told nobody.

Corroborative Evidence.

Whether it was during the ghost's meetings with the first-mentioned officer or not I am uncertain, but certainly after his first appearance another officer of the Staff was asleep in bed after a hard day's work when he awoke suddenly with a feeling that there was somebody in the room. He raised himself slightly and looked at the foot of his bed. There, by the light of a dying fire, he saw indistinctly but certainly the form of a man in uniform sitting on the chair at the foot of the bed.

He sat up and asked the form who he was and what he wanted. As he got no reply he leant right forward to have a good look at his visitor. And when he was close enough to identify him the form was not there.

Somewhat naturally he was puzzled, and, though he was quite certain that there had been somebody in the room, he, like the first officer, decided to say nothing about it. One does not willingly advertise the fact that one is suffering from hallucinations.

Then, a little later, two officers sleeping in the same room in the Old Mess were awakened one night by a feeling of oppression, and the knowledge that a third person was there.

One of them woke up with this feeling, spoke to the other, and found that he also was awake and had the same impression.

They struck a light, and, of course, saw nobody except themselves. And they, like the other two, decided to say nothing. I believe one of them was a Canadian.

Thereafter one or two other officers in the Old Mess were disturbed by a mysterious visitor whose presence they felt but whom they could not see nor touch. And so, without anybody mentioning the business to anybody else, an air of mystery, or, at any rate, a general feeling of uneasiness began to creep over the Staff.

The Common Explanation.

How knowledge of the visitations first became common property I cannot say. Probably somebody's nerve broke and he told a friend, and the friend happened to be one of those who had also been visited. In any case, the affair came out and the Staff began to talk to one another about it. And eventually the story worked round the R.F.C., where it was generally told either as a "creepy" story or as a joke against the Staff at Montrose and their nerves. Some few people perhaps took it seriously.

The only explanation of the ghost that I ever heard was that some time earlier a "Hun" had been sent up for his first flight alone and before going up had said that he did not feel like flying. Orders being orders, he went up, crashed and killed himself.

The Staff at Montrose and some others seem to have assumed that the ghost was this unfortunate young officer, who was haunting the Instructional Staff, whom he blamed for his death.

A Search for Reason.

Now when one comes to consider this explanation it is absurd on the face of it If every pupil in the Flying Services who had been killed through going up alone under orders when he did not feel like doing so had taken it upon himself to haunt the Mess in which his Instructors lived, every training station in Great Britain and France and Germany and Italy and the United States, not to mention Canada,

Australia, and Egypt, would have been full of ghosts. Obviously, therefore, it would have been a gross impertinence for one "Hun" to single out Montrose for his hauntings.

Consequently that theory had to be set aside and a more reasonable explanation had to be found. The first thing to do was to get hold of actual definite dates. This I was able to do, thanks to certain people whose names I cannot mention. And as soon as those dates had been ascertained the explanation became quite simple.

It turned out that, as in the case of all really respectable ghosts, the hauntings were concerned with a matter of ancient history. At any rate, they were ancient so far as aviation was concerned.

A Matter of Ancient History.

It will be remembered that in the Spring of 1916, as the result of continual attacks on the administration of the R.F.C., by Lord Montagu, Mr. (now Sir) W. Joynson-Hicks, Mr. N. Pemberton Billing and others, including my more or less humble self, the Government decreed that a judicial enquiry should be held into the R.F.C.'s affairs. The chief feature of this enquiry was the investigation of the so-called "Murder Charges" made by Mr. Pemberton Billing, M.P.

These charges alleged that certain officers had been murdered rather than killed through the carelessness, incompetence or ignorance of their senior officers or of the technical side of the Royal Naval Air Service and the Royal Flying Corps. As it was quite easy to prove all sorts of such charges against the handling of the R.N.A.S., the Admiralty, backed by the Government, refused an inquiry into the R.N.A.S., and the Cabinet only permitted the state of the R.F.C. to be investigated.

The Government at that time was seething with wrath against Mr. Billing, and—cheerfully ignoring the fact that the first "Murder Charge" had been made in the House early in 1914 by that eminently respectable Tory, Colonel Walter Faber, M.P.—the Government turned all its heavy guns onto crushing Mr. Billing. Consequently on Aug. 3rd, 1916, the obedient Committee of Enquiry issued an "Interim Report," dealing only with the "Murder Charges," proving to its own and the Government's satisfaction that such charges were without foundation, and that Mr. Billing was a worthy confrere of Mr. Kipling's "Paget M.P." who "was a liar, and a fluent liar therewith."

The Case of Desmond Arthur.

This precious Interim Report merely caused the R.F.C., who knew the bitter truth, to smile sardonically. But it gave the daily Press, ever subservient to the Coalition, some splendid chances of attacking Mr. Billing, which it did with about as much vehemence and ultimate effect as a garden-hose squirting at a duck.

The last item in this Report reads as follows :—

> STATEMENT BY MR. PEMBERTON BILLING.—Desmond Arthur was killed on some type of B.E. machine which had been repaired by the Royal Aircraft Factory. The repaired part broke at 4,000 feet up. and the pilot was pitched out.
>
> SUGGESTION.—Faulty design or bad repair.
>
> FACTS.—The date was the 28th May, 1913. The place Montrose. There was a suggestion made at the time that there had been a patch on the outside of the right wing of the plane, and that someone had broken the tip of the wing, then repaired it, and put a patch on the repaired part. The suggestion being that this was done by someone with a view to hiding some damage which he had done to the machine. The matter was closely enquired into at the time by a Committee, of which Mr. H. T. Baker, M.P., was Chairman. The Committee have had the notes of the whole of the evidence given to that Committee before them. There were some 23 witnesses. The suggestion depends on the unsupported evidence of one man out of these 23 witnesses. No useful purpose would be served in re-opening the matter, especially as some of the witnesses called have since been killed.
>
> A perusal of the transcript of the notes of evidence leads to the conclusion that the suggestion of the patch is quite unfounded.

Now, apart from the horrible English of that section of the Report, the statements therein constitute a *suppressio veri* which amounts to a *suggestio falsi*. Boiled down to blunt brutality it means that there never had been any bad work done on the machine and that Desmond Arthur fell out of the machine and was killed through his own foolishness. This looked well in the public Press, but everybody who remembered the accident knew it to be untrue.

The Facts of the Case.

The facts of the case were these.—Desmond Arthur was one of the finest pilots in the world. He had taken his certificate in 1912 on a Bristol box-kite with a 50-h.p. Gnôme at Brooklands, and had done the test flights at a height of 3,000 feet, an absolutely unprecedented performance. He joined the R.F.C. Reserve and was posted to Montrose.

The machine on which he was killed was a B.E. of sorts (a 2a, if I remember rightly). It had been used on Salisbury Plain and had then been sent to Farnborough, where it was rebuilt by the Royal Aircraft Factory and handed over to the R.F.C. at Jersey Brow. Thence it was flown to Montrose by Major Burke, a very steady pilot who never did anything violent.

A few days after its arrival Desmond Arthur took it up and at 4,000 feet began throwing it about, doing vertical banks, and what would now be called "zooms"—looping was not done in those days. Then the machine was seen to check suddenly, the pilot was seen to fall out, and the machine fluttered down alone and was somewhat badly broken.

In due course the Accidents Committee of the Royal Aero Club investigated the affair, and found that one wing-tip of the machine, including the overhang of one spar, had been broken. This might have been done in collision with another machine on the ground, or with the door-post of a shed. Or the wing might have been dropped on its tip when being taken off or fitted onto the machine, or when being handled in a workshop. Examination showed that the spar had been badly glued together, without any pegging or wrapping, and a patch had been put over the damaged fabric. It was never proved definitely whether this concealed crime had been committed in the Royal Aircraft Factory or in the R.F.C. sheds on Jersey Brow.

The R.F.C. books showed no trace of any repair having been done to the machine. But the machine had certainly been in the hands of the R.A.F. Consequently R.F.C. opinion held that the "Factory" was to blame.

In any event, it was quite clear that Desmond Arthur was the victim of this crime, for examination of the machine after the accident showed that the badly glued joint had come away in the air without hitting the ground. And the sudden collapse of a whole wing-tip on such a machine would certainly twist the machine round so suddenly as to throw out any pilot who was not strapped into it.

Either the Enquiry Committee was ignorant of the existence of the Aero Club Report, or chose to ignore it in favour of the evidence of an Official Committee which sat long after the Aero Club had investigated the case on the spot. In either case the Enquiry Committee chose to brand as the victim of his own folly a very skilful and gallant officer who was in fact the victim of a Service crime.

A Tardy Reparation.

The Final Report of the Enquiry Committee of 1916 was dated November 17th, 1916, but was not issued until a day or two before Christmas, when all the papers were too full of other affairs to pay any attention to it, and when people were thinking about Christmas jollifications—in spite of the perilous state of our Armies in France. Also the excitement over the Enquiry which existed in the Spring and early Summer had died down, and most of the abuses which caused the Enquiry were in a fair way to be remedied. Consequently the Final Report was hardly noticed.

This Final Report had an addendum entitled, "Further Memorandum from Mr. Bright and Mr. Butcher." Mr. (now Sir) Charles Bright is an engineer of high standing and was, in effect, the only engineer who sat on the Committee throughout its operations. Mr. Butcher, K.C., is a lawyer of note. Their Memorandum includes the following phrases :—

> Since the issue of our Interim Report attention has been called to the finding of the Royal Aero Club's Public Safety and Accidents' Investigation Committee regarding the fatal accident to Lieutenant Desmond Arthur. It is to be regretted that the said Committee's Report—and the evidence on which it was founded—was not brought to our notice by any witness dealing with the subject during the course of the enquiry. . . . . It appears probable that the machine had been damaged accidentally, and that the man (or men) responsible for the damage had repaired it as best he (or they) could to evade detection and punishment.
>
> In making this statement we are taking the first suitable opportunity of amending—so far as we personally are concerned, and to the extent indicated—what appears on pages 7-8 of the Interim Report.

Thus it will be seen that Messrs. Bright and Butcher did all that gentlemen could do to make honourable amends for an unworthy slur cast on an officer and gentleman by the Interim Report. It has always puzzled me to understand why these two were the only members of the Enquiry Committee to act in this way. Apparently, however, their kindly action served its purpose.

(*Continued on p.* 967.)

IN THE NEW YEAR.

There will be many interesting developments in the New Year. It is said, for example, that the British Government intends to subsidise British air lines so that they can compete successfully with the subsidised French air lines in the future. Also it is said that the British subsidy is to be paid on a system of "payment by results," a system of which some of our fellow-citizens do not approve.

The French system is a subsidy on mileage which is also "payment by results." It is in this case a wrong system, for it pays in France to use any old machine with any old engine, bought from "Disposals" at scrap prices. The cheaper the outfit the better it pays on the subsidy.

The British system is, so it is said, to be a payment on the basis of traffic receipts. That is to say the Government will pay the air lines a percentage on the money taken in passenger fares and freight charges. This is quite sound, for it encourages good business methods, and that truest of all economies a thoroughly reliable outfit of material.

Cheaply built or obsolete machines will be the worst form of economy for any British air line in the New Year, for the earning capacity of the air line will depend, firstly, on keeping all its machines in use for the maximum period, and, secondly, on giving users of the line confidence in the reliability and suitability of the firm's equipment of machines and engines.

THE QUESTION OF RELIABILITY.

Now when the question of reliability arises, naturally anyone with any knowledge of the history of British aircraft naturally thinks of Fairey aeroplanes. When people recall the history of individual Fairey seaplanes, such as the old Number 10, which has been a Naval patrol machine, an experimental land machine, a pioneer amphibian, a racing seaplane, and a successful competition amphibian; or Lieut.-Col. G. L. P. Henderson's old seaplane, which started as a Naval two-seater, became a joy-ride seaplane in Sweden, was then turned into a four-seater passenger machine, afterwards became a snow-flier on skis, and is now a regular air-line machine inside the Arctic Circle; then they begin to appreciate what real reliability means in connection with aeroplanes.

Machines which have been through so many transmogrifications, and have never failed to do their work satisfactorily though all the material in them is years old, prove that Fairey aircraft are undeniably reliable.

THE QUESTION OF SUITABILITY.

Reliability alone is not enough. An air-line machine may be wholly reliable and yet may not pay for its keep because it is unsuitable for its work. Where the Fairey aircraft are concerned there is no doubt about their suitability. Take these same machines mentioned in the previous paragraph. Whatever the job to which they have been turned they have proved their suitability for it.

Whether carrying passengers and baggage across the Baltic from Sweden to Finland, or racing at Bournemouth, or performing amphibian feats between Southampton Water and Croydon, or between Felixstowe and Martlesham, or flying off ice in Scandinavia, or flying off the decks of warships at home, the Fairey aircraft have always proved their suitability for their jobs.

AT HOME OR ABROAD.

Undoubtedly, subsidies or no subsidies, it is certain that there will be much air line work done in the New Year both at home and abroad. On sheer performance there is obviously no aeroplane to-day which can beat the Fairey for reliability and suitability for air line work.

Do not forget that, as in most things aviatic, the Fairey has done pioneer work on air lines. It was a Fairey which did the pioneer work of running a newspaper air line from the Thames (Westminster Bridge) to the seaside resorts in the Isle of Thanet. It was a Fairey which did the pioneer work on the trans-Baltic air line from Stockholm to Helsingfors. It was a Fairey that pioneered the air line that will be some day along the coast of Spitzbergen.

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THE WEEKLY COMMENTARY.

Such particulars as can be obtained of the Gastambide-Levavasseur variable surface wing are given below. The device is interesting, but scarcely seems practicable as a solution of the low landing speed problem.

Details of a number of new machines, of British, Italian, and Japanese origin, will be found on pages 956 to 960. The revival of "Pusher" type biplanes for instructional work—shown by the Vickers "Vim"—is noteworthy.

The *finale* of the controversy on the steam turbine as an aerial prime mover will be found on page 960, in the form of a letter from Messrs. Richards and Butler, and a short note by Capt. Sayers.

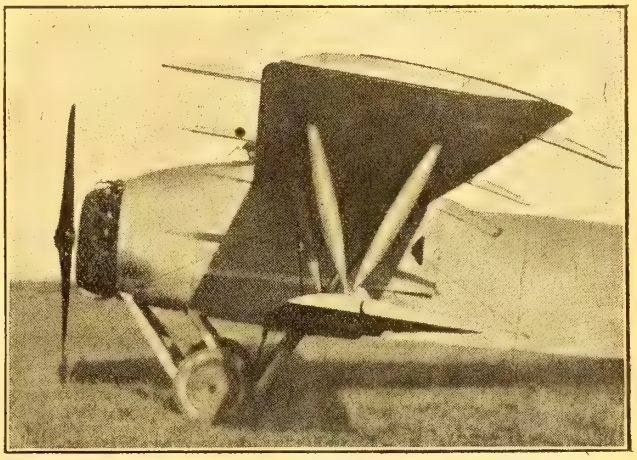
THE GASTAMBIDE-LEVAVASSEUR VARIABLE SURFACE WING.

A certain amount of information is now available as to the new Gastambide-Levavasseur machine which is fitted with a wing of variable surface and camber.

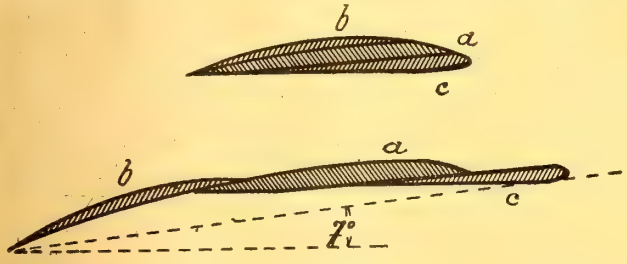
The general idea underlying the wing is fairly simple. It is composed of three sections, sliding one over the other, of a form somewhat as shown in the attached sections. The lower of the three sections forms the leading edge, and the upper one forms the trailing edge. The central section is fixed and contains the spars and ribs, the latter projecting fore and aft to serve for the support of the movable actions.

To extend the surface the leading edge slides forward, and the trailing edge aft, the latter moving farther than the former in order to keep the C.P. of the whole wing roughly stationary. This greater movement of the trailing edge also secures that as the wing is extended the depth of camber and the angle of attack also increase.

It is stated that the shape of the three sections composing the wing are such that in any state of extension the wing presents an unbroken surface, but from the very poor photographs available it would appear that the moving parts of the wing are merely thin carved strips, and that the extended section is of very bad shape. No details are published as to the mechanism used for changing the wing area and form.

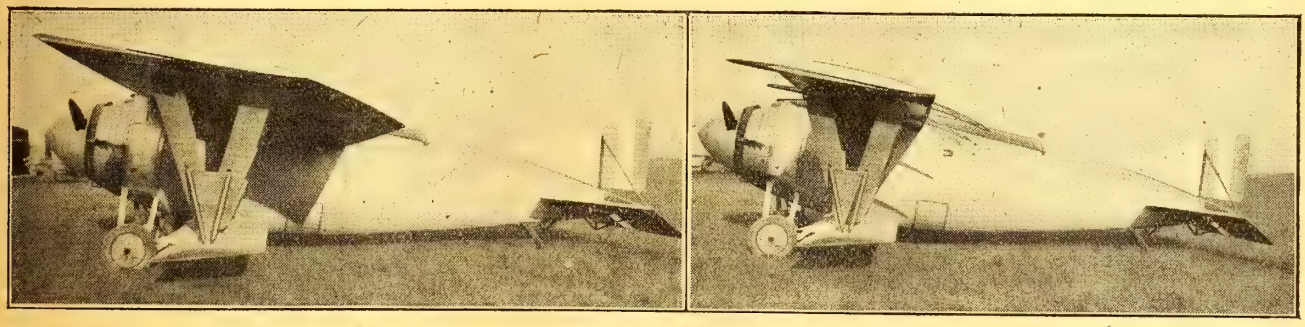


The first variable surface wing in the closed position.

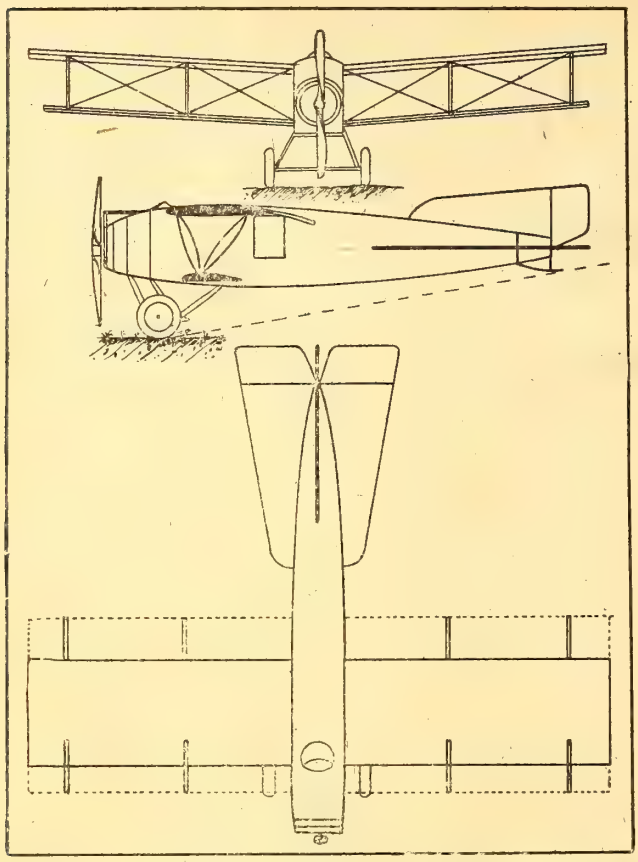


A sketch showing the arrangement of the Gastambide-Levavasseur Wing.

The photograph shown above is of a machine recently tested before the S.T.Ae. The machine is a tractor biplane, with a fixed lower wing, the upper surface alone being variable. The span is 12.5 metres and the chord of the upper wing can be varied from 1.66 metres to 3.28 metres—a range of nearly 1 to 2. The change in total surface is from 32 to 52 sq. metres. It is stated that on test the machine, with a 260-h.p. Salmson engine, gave a speed range of from 60 to 200 km.p.h. (37.5 to 124 m.p.h.). In the absence of any data as to the extra weight



THE SECOND GASTAMBIDE-LEVAVASSEUR MACHINE.—On the left with wing extended for landing and low speed flight. On the right the wing closed for high speed.



General arrangement of the first Gastambide-Levavasseur Variable Surface Wing Biplane.

of the wing structure and control gear and the weight of the complete machine it is naturally impossible to estimate whether this result has any real value.

But it is at least an encouraging result, and it is of very great interest in view of the past history of the designers. M. Gastambide was the designer of the Gastambide-Mengin monoplane of 1909—the original of the once famous Antoinette monoplane. M. Levavasseur was responsible for the Antoinette engine, and in this work he was certainly encouraged by his friend M. Gastambide.

It is also of interest that the actual machine which is referred to above was built by M. Jean Latham, a cousin of the late Hubert Latham, the famous Antoinette pilot.

A second machine, generally similar in dimensions and arrangements, has now been built and awaits test.

THE ANSALDO 300 C. BIPLANE.

The Societa Anonima Aeronautica Ansaldo of Turin, have recently produced a modification of their type 300 biplane, essentially for civilian use. In tests carried out by Sig. Mario Stoppani the 300 C., as this machine is called, has given some very satisfactory results.

It is a single-engined tractor biplane of the totally enclosed type and has accommodation for pilot, mechanic and four passengers. The fuselage can be either built up of steel or wood longerons, and is made in halves, detachable at a point just in rear of the passengers' cabin, for ease of transport. The front part of the fuselage carrying the 300-h.p. type 12 bis Ansaldo engine is covered with aluminium, the central portion containing the pilot's and passengers' cabins is covered with wood, while the rear portion is fabric covered in the usual way. The planes are attached to the upper and lower centre sections, both of which are built integral with the fuselage, and are braced by two pairs of outwardly raked steel tube vees, which meet midway up the fuselage, with the ends of the two legs of the vees attached to the outer ends of the upper and lower centre section front and rear spars. The planes are supported by two pairs of steel interplane struts of streamline section on either side and have four unbalanced ailerons, one on each plane.

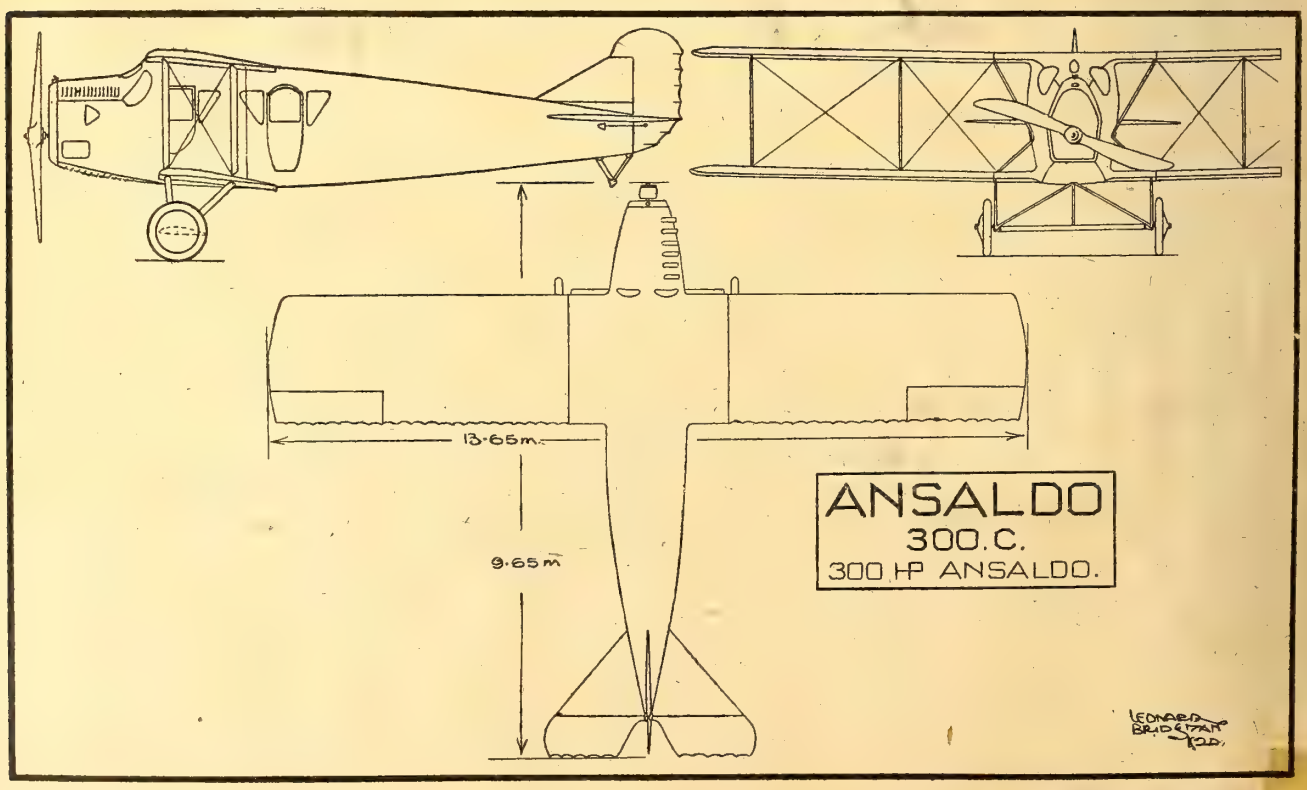
The under-carriage resembles that which was used on the Bat "Bantam," in that it consists of two vertical vees running from the lower plane at a point directly under the first set of plane struts, in this case, the lower members of the centre section bracing struts. These vees are braced by steel tubes running down from the centre of the under-surface of the fuselage. The axle, which is suspended by rubber shock-absorber, has built up on it a small wing section.

The tail unit is of typical Ansaldo form and construction, and consists of a fixed tail plane and divided elevators, fin and a balanced rudder.

The cabins for the pilot and mechanic and four passengers, respectively, are minus any internal cross-bracing, are amply supplied with windows, and fitted with side doors.

The passenger cabin is very well appointed and has four wicker and upholstered chairs, two facing forward and two backward.

The engine is a twelve-cylinder Vee giving 300 h.p. at 1,600 r.p.m. Cooling is by a honeycomb nose-radiator, which is fitted with sectional radiator shutters. Fuel is carried



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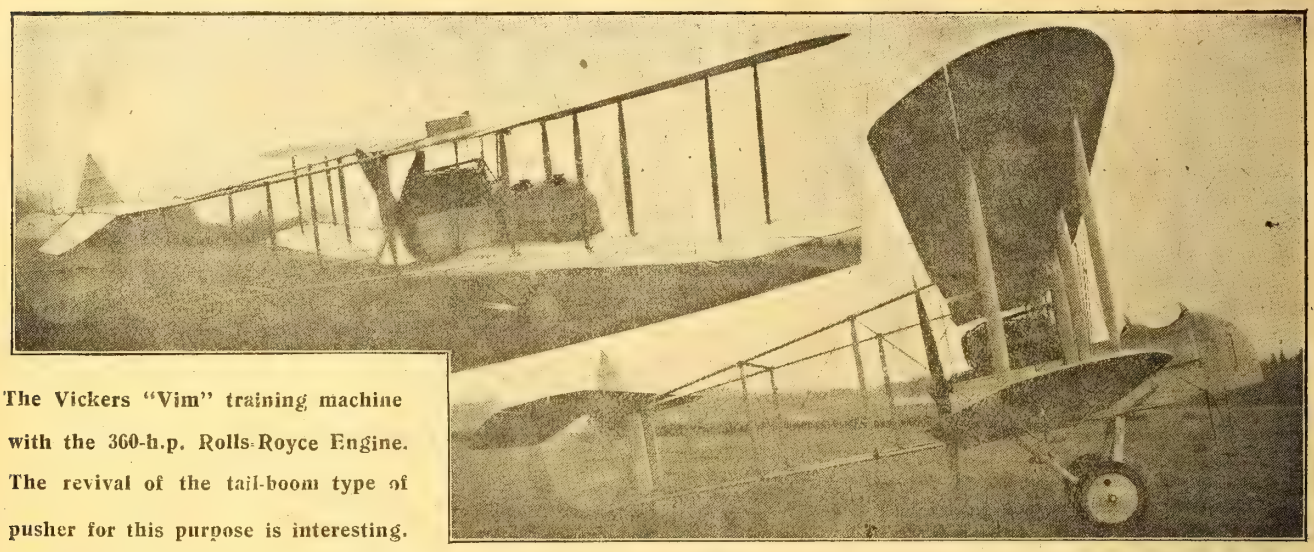
in a main tank, and is raised by pressure to a gravity tank situated in the roof of the cabin.

Specification of the Ansaldo 300c.

Span	13.65 m.	Height	3.255 m.
Useful load	750 kg.	Weight (loaded)	1,900 kg.
Surface	44 sq. m.	Speed	180 km.p.h.
Length	9.65 m.	Range of action	5 hr.
Weight (empty)	1,150 kg.		

A NEW VICKERS TRAINING MACHINE.



The Vickers "Vim" training machine with the 360-h.p. Rolls-Royce Engine. The revival of the tail-boom type of pusher for this purpose is interesting.

The photographs attached are of the Vickers "Vim"—a high-powered training machine which has just been produced.

The machine is a two-seater pusher biplane arranged for flying tuition preparatory to instruction on the "Vimy." A system of dual controls similar to that of the "Vimy" has been installed, the pupil being located at the front of the nacelle and the instructor close behind.

The cockpits have been arranged to reproduce "Vimy" conditions as far as possible, all necessary instruments and controls being provided both for pilot and pupil. The motor is started by the geared hand starter which is operated from the rear cockpit.

In general arrangement the machine follows closely the lines of the old Vickers "Gun-'bus" which did such excellent service in the earliest days of the war.

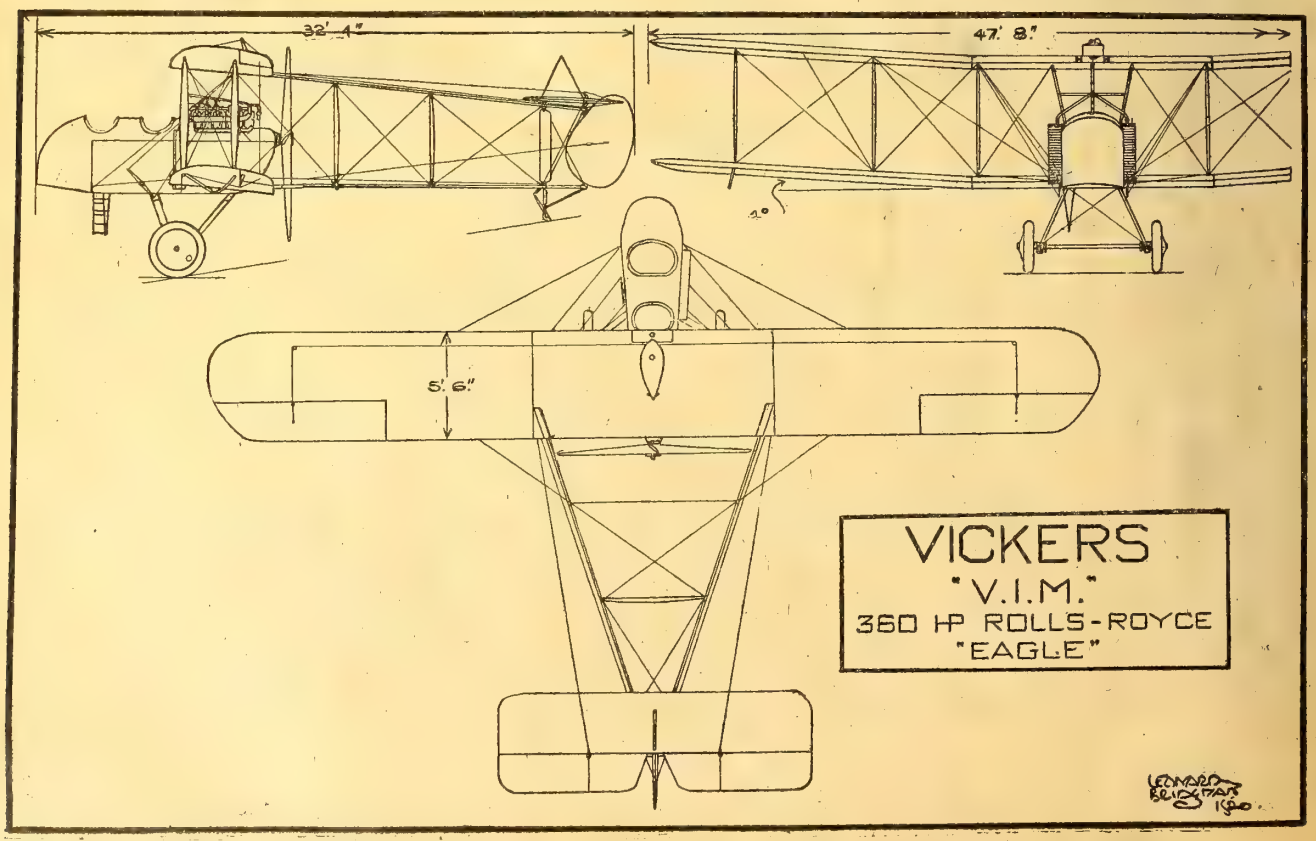
The power plant is the Rolls "Eagle" of 360 h.p. driving a four-blade airscrew and cooled by side radiators attached to the nacelle in line with the leading edge of the wings.

The main fuel supply is carried in the nacelle, and a Vickers wind-driven pump feeds thence to a small gravity tank in the top centre section, which supplies the carburetters.

The main dimensions, etc., are given below :—

Specification of the Vickers "Vim."

Overall length	32 ft. 4 in.	Loading per h.p. (360),	10.4 lb.
Overall height	12 ft. 4 in.	Engine	Rolls-Royce "Eagle," 360 h.p.
Overall span	47 ft. 8 in.	Weights—	
Chord	5 ft. 6 in.	Machine empty, with water,	2,950 lb.
Incidence	4¼ deg.	Petrol (39 gall.)	281 lb.
Dihedral	4 deg.	Oil (6 gall.)	54 lb.
Area of main planes,	488 sq. ft.		
Loading per sq. ft.	7.5 lb.		



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LONDON, W.1.
Telephone: Gerrard 4500.
Telegrams: Martinsyde, Piccy London.

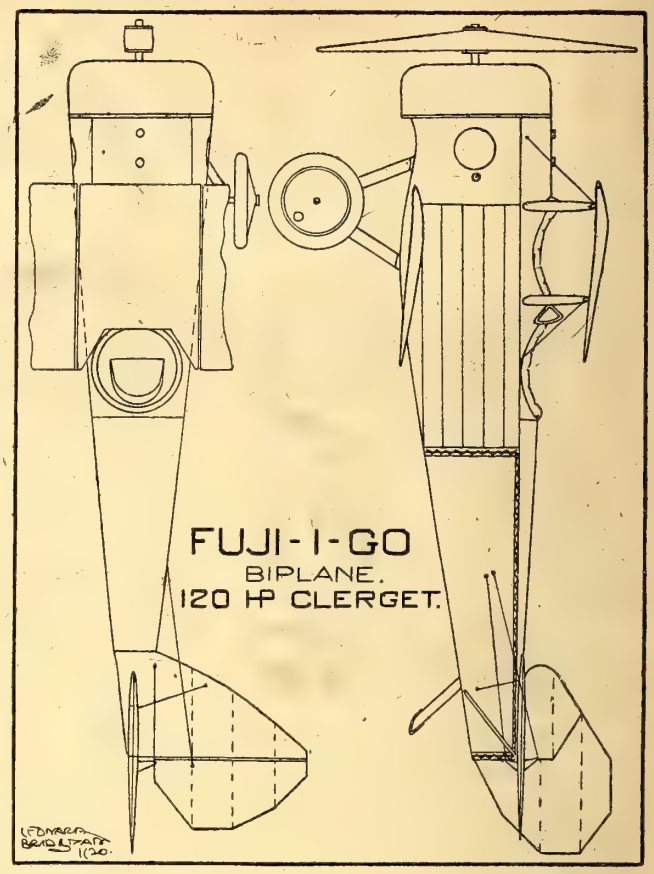
Pilot and pupil .....360 lb.
Total weight.....3,645 lb.
Performance—
Full speed near ground, 100 m.p.h.
Time to 6,000 ft....8.25 min.
Full speed at 6,000 ft., 97 m.p.h.
Service ceiling ...13,000 ft.
Endurance at 2,000 ft. at 80 m.p.h., 2¾ hr.
Landing speed ...45 m.p.h.

A JAPANESE TWO-SEATER.

The attached drawings illustrate the Fuji-I-Go two-seater, designed by Mr. T. Inga Ki, of the Itoh Aircraft Factory, Tsudanuma. As may be seen, the general outlines are very similar to those of certain Sopwith machines. The machine appeared at the first Tokio flying meeting early in 1920 and, piloted by Mr. Y. Gotoh, won first prizes for altitude and for advanced flying, and established a new Japanese altitude record of 5,000 metres. The appended specification—which, together with the drawing and the above information, are due to Mr. N. Katoh—gives the main dimensions.

Specification of the 120-h.p. Fuji-I-Go Biplane.

Manufactured by Itoh Aeroplane Factory, Tsudanuma, Chiba Prefecture.
Type of machine, Two-seater tractor biplane.
Purpose for which intended, High-speed training or sporting.
Span .....9.340 m.
Chord .....1.370 m.
Gap .....1.370 m.
Overall length .....6.050 m.
Height .....2.500 m.
Total area of wings, 23.2 sq. m.
Incidence .....3 deg.
Dihedral angle (lower wing only), 1 deg.
Camber .....R.A.F. 6.
Area of ailerons ...2.23 sq. m.
Area of tail plane, 1.26 sq. m.
Area of elevator, 1.02 sq. m.
Area of rudder .....0.74 sq. m.
Engine ...Le Rhône, 120 h.p.
Tank capacity in hours.....5
Weight empty .....740 kg.
Useful load .....250 kg.
Speed range .....45-95 m.p.h.
Climb ...1,000 m. in 3.5 min.



THE TURBINE CONTROVERSY.

The following letter has been received :—

Sir,—In accordance with your fiat that space for lengthy argument on the steam turbine question cannot be spared, we are precluded from replying to Capt. Sayers' arguments in detail.

We are pleased to have Col. Bristow's opinion and note that in all our principal points we have his concurrence. Unfortunately, few remarks about insurance appear in his letter, and we should have been glad to have had his views on this subject in addition to those on the technical aspect of the question.

It is regretted that our original scheme of one propeller coupled to both rotating elements by means of a special double epicyclic gear of our own design was not clear to him, and hence his remarks as to regulation, etc., are based upon false premises.

The point raised by him about gyroscopic effects is a pertinent one, but as the two elements are rotating in opposite directions and the discs are light in weight the actual interference with control would be nil, the stresses being all internal and small.

Col. Bristow, we think, at any rate, removed every reason for calling the question a "scare."

With regard to the "non possumus" attitude adopted by Capt. Sayers, we submit that progress will never be made by reiterating "I can't." Whilst we are at a deadlock over points of detail, we agree, in the absence of development work, that the steam plant is not yet a commercial proposition, we must strongly refuse to agree that it never will be.

We must remind him that though he accuses us, we think unfairly, of political dodgery, yet there is another form of political manœuvring known as "howling down your opponent," and we think it as well to leave the controversy to generate in the minds of your readers whatever interest they are disposed to devote to the subject.

Had we proposed to invite expenditure by the Air Ministry, company, or private individuals, or endeavoured to float any scheme involving public credence, Capt. Sayers' denunciation would have had more critical value, but we have only endeavoured to put forward in a considered statement the position of the problem, stating frankly its limits and hopes, in order that serious engineers interested in aero prime movers might be fully informed as to the state of exploration work to date in this field. We cannot believe that such engineers, though they may at the moment be providing the most reliable of petrol engines yet produced, will be content to adopt an attitude of "laisser faire" after studying the limitation of progress imposed by the present engines on commercial aviation development.

(Signed) Geo. Tilghman-Richards, F.R.Ae.S., M.I.M.E., M.I.Ae.E. (Hons. Diploma).
R. T. Butler, M.Inst.Naval Architects.

A Final Note.

The above note puts the claims of the steam turbine into its proper place. As originally stated, the case made by Messrs. Richards and Butler appeared to imply that the turbine was immediately capable of installation as an aero prime mover, except in regard to condensers, and that no serious difficulty was expected in that respect. Further, that so installed it would immediately be superior to the I.C. engine in economy and reliability.

My attitude is not that the turbine cannot possibly become a satisfactory aero-engine, but that before it can reach that stage it will require an immense amount of improvement.

Before improvements have reached that stage they will have a large commercial value in other spheres, and until steam plant much lighter, more compact, and simple than any now existing has demonstrated its reliability on other services it is not legitimate to claim for a hypothetical steam plant the good qualities of widely different plants now existing.

I am the last person to discourage research, but in this case it were better not to discuss the aero possibilities of the plant in question until it has reached a stage of practical achievement under less trying conditions.—W. H. S.

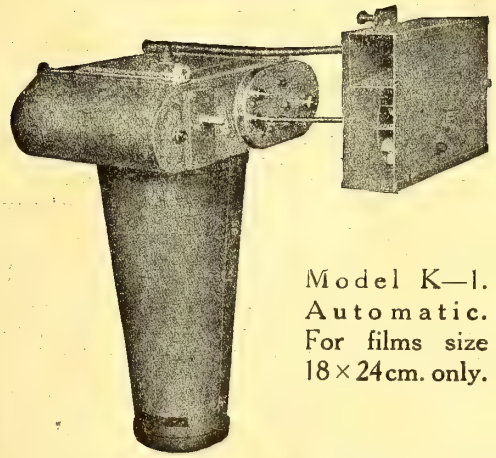
AN AERIAL IRRIGATION CO.

A Mr. A. E. Cole, of Winnipeg, and his son, who used to be a captain in the R.A.F., are planning to form an aerial irrigation company. Their scheme is to cause rain by spraying liquid air into the clouds from an aeroplane.

When it is realised that liquid air has a temperature of something round 200 degrees below zero (Centigrade), and the spraying effect would only be in the immediate vicinity of the aeroplane, one would imagine that the pilot would suffer from decidedly frost-bitten feet, caused partly by the chunks of frozen cloud floating around that would be a danger to aerial navigation, and mainly by the extremely low temperature of the surrounding air.

As for causing rain, it would be about as effective as anyone emulating the characters in one of Contact's priceless yarns in his "Airman's Outings," who, on being discovered by some French "poilus" after being forced to land behind the French lines, were found to be performing a perfectly natural function, as portrayed by a celebrated fountain in Brussels. *"Quels types!"*—L. B.

Aerial Photography



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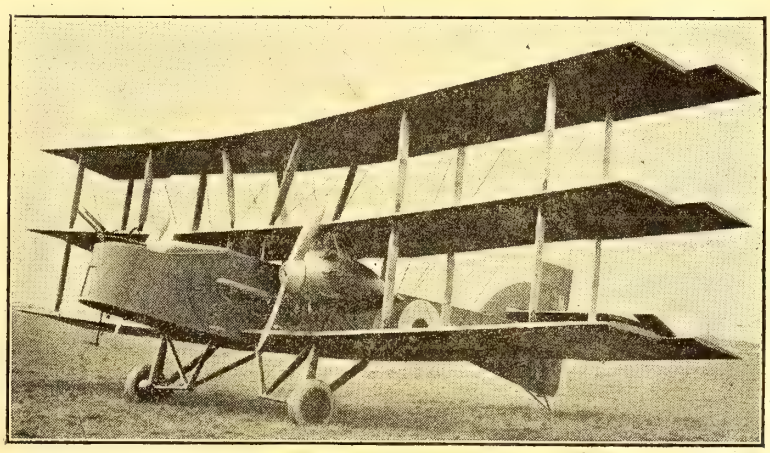

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PIONEERING.

The following letter has been received :—

Rochester, December 21st, 1920.

Sir,—I was interested to read in your issue of Dec. 15th the letter of the De Havilland Aircraft Co., Ltd., relating to their production of a twin-engined aeroplane in the year 1916.

I believe Messrs. Short Bros. can claim to have produced the first twin-engined aeroplane in this country. From the designs of my late brother, Horace Short, three machines of this class were built and flown before the end of 1912. Two of these machines embodied the principle of tandem engines so that one propeller was working in the slipstream of the other.

There were many wise heads shaken at this innovation, but the effectiveness of such an arrangement was proved in the only practical manner by a full scale test, and no doubt designers of later tandem-engined machines received much support from these early examples

I should not do justice to a benefactor of British aviation if I failed to mention that these twin-engined machines were built to the order of Mr. Frank McClean (later Colonel, R.A.F.). (Sgd.) OSWALD SHORT.

THE ZODIAC SPORTING AIRSHIP.

The Societé Zodiac are producing a small airship capable of carrying two persons, and fitted with a 60-h.p. Le Rhone, type Z.9 engine; its uses being either that of a "type sport et tourisme," or an air instructional and training airship. The envelope, which has a cubic capacity of 1,000 cubic metres, is fitted with one ballonet, together with the usual air scoop brought down into the slip-stream of the airscrew.

The control surfaces consist of two single fins and rudders above and below the gasbag, and two single tail-planes and elevators fitted one on either side of the envelope, the whole of the controlling surfaces being situated well forward of the end of the envelope

The car, which is suspended by stuck-on patches, consists of a built-up fuselage carrying the engine under a circular cowl on the nose. Midway along the fuselage are situated the side-by-side seats fitted with one set of controls. In advance of the two seats the fuselage swells upwards into a cabin, the lines then tapering aft to a point. Sufficient fuel is carried for a flight of five hours. A front skid is provided to protect the airscrew on landing, together with a small "tail skid" under the rear of the car.

AN AMERICAN TEXT BOOK.

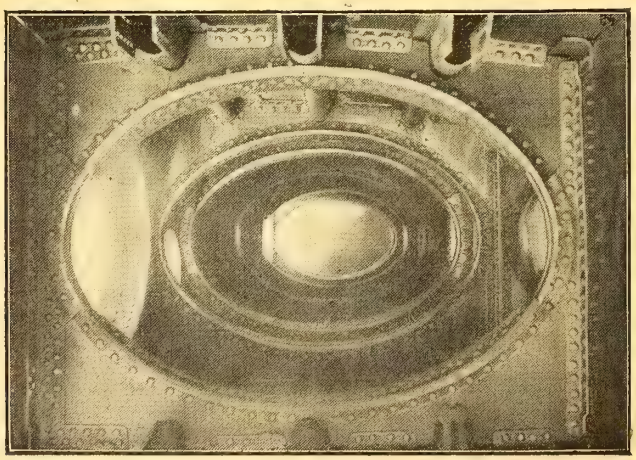
THE AIRPLANE. By Frederick Bedell, Ph.D. Price $3 net. Published by D. Van Noshand Company, New York.

A study of the elementary mechanics of the aeroplane, intended apparently for the use of those possessing some knowledge of mechanics, and desiring a knowledge of the general principles of the operation of such craft. Alternatively, it might be used as a text-book in secondary schools for an introduction to the principles of aeroplane design.

The treatment of the subject is clear except for the markedly American language which is employed, but the book contains nothing of novelty either in regard to facts or to treatment.

WANTED.

Can any reader of THE AEROPLANE who has unneeded back numbers oblige with a copy of the issue for June 11th, 1919? A reader of THE AEROPLANE particularly wants a copy of that issue, and if any other reader can oblige with a copy he will be doing a kindness if he will send it to this address marked A. H. G.



The tunnel in the wing of the Zeppelin Giant Monoplane, which allows a mechanic to reach the engines from the fuselage.

AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 16, 1920.—RENEWALS OF LICENCES: COMPLETE SETS OF NOTICES NECESSARY.

It is hereby notified:—With reference to Notice to Ground Engineers No. 1 (Explanatory Statement), *all* Ground Engineers will in future, when applying for renewals of their licences, be required to submit proof that they have received a complete set of Notices to Ground Engineers issued up to date.

All Ground Engineers will be supplied regularly with free copies of "Notices to Ground Engineers" on application to the Secretary (C. of L.), Air Ministry, London, W.C.2

Air Ministry, Dec. 17th, 1920.

TRADE NOTES.

The Blackburn "Swift."

The quaint torpedo-carrying aeroplane, known as the Swift, built by the Blackburn Aeroplane and Motor Co., Ltd., Leeds, and exhibited at the Aero Show at Olympia, is now completed and has carried out preliminary trials.

By permission of the Air Ministry, a demonstration of the machine's qualities was arranged for the forenoon of Tuesday, Dec. 21st, and the Naval Attachés of various friendly Powers were invited to Brough for the occasion.

Naturally all the important details of the torpedo suspension, heater apparatus, and release gear were removed for the occasion.

Unfortunately, on the appointed morning it blew a gale and rained heavily, and it was not considered wise to take the risk of taking the machine—necessarily light as no torpedo could be caried—out onto the aerodrome.

The extraordinarily good view given the pilot, the compactness of the folded machine, and the sturdy and workmanlike construction gave a favourable impression.

The machine was described in THE AEROPLANE of July 14th.

Much nonsense has appeared in the Press about this machine, chiefly in the *Morning Post*, whose Leeds correspondent called it a "British secret," apparently believing that it is the first torpedo-carrying aeroplane. The Press is apparently still ignorant of the fact that Turkish ships were sunk by torpedoes dropped from seaplanes in 1915, and the German torpedo-droppers sank British ships in the Downs in 1917-18. And *of course* the Press has never heard of the Sopwith "Cuckoo," the first deck-flying torpedo-dropper, which machine was turned over to the Blackburn Co. for production in 1917, and so was the ancestor of the "Swift."

The Napier Engine.

It is worthy of note that, while so many aircraft firms are at a standstill in that particular business, D. Napier and Son, Ltd., are still hard at work on aero engines. They had an Air Ministry order for 50 "Lions" and now this has been supplemented by a further order of 41 of the same type. In addition they are renovating some earlier "Lions."

It is an open secret that the firm may shortly produce a new engine, and in this connection it is interesting to note that Mr. Solomon, who says he has been with the firm since its foundation 122 years ago— [He wears well!—Ed.]—has a most interesting little model for display, though, as he rightly asserts, this is not complete.—G. D.

COMPANY NOTICES.

The Sopwith Case.

In the Chancery Division sitting before Mr. Justice P. O. Lawrence on Dec. 21st, on the petition of Messrs. H. M. Hobson, Ltd., the Court sanctioned the appointment of two liquidators and a committee of inspection in the affairs of the Sopwith Aviation and Engineering Company Ltd. It was stated that a resolution in favour of two liquidators was unanimously passed at a meeting of 147 creditors, representing £56,000.

Mortgages, Charges and Debentures.

DAVIDSON WOODWORKING AND ENGINEERING CO., LTD. (formerly DAVIDSON AVIATION CO., LTD).—Satisfaction to the extent of £2,000 on Nov. 26th of 2nd debenture, dated May 7th, 1920, securing £5,000.

LANG PROPELLER, LTD.—Mortgage dated Dec. 10th, 1920, to secure £30,000, charged on certain land and premises in Weybridge. Holder: R. Gliksten, Carpenter's Road, Hackney, E.15.

AIRCRAFT MANUFACTURING CO., LTD.—Satisfaction in full (a) on Oct. 2nd, of charge dated March 31st, 1920, securing £22,900; (b) on Dec. 3rd, 1920, of mortgage dated March 25th, 1918, securing £4,000; and (c) on same date of charge dated Nov. 20th, 1917, securing £5,000.

Receiverships (Appointment or Release).

A.G.S. MANUFACTURING CO., LTD.—D. H. Allan, of 4, Fenchurch Avenue, E.C., as receiver on Nov. 26th, 1920, under powers contained in instrument dated June 12th, 1918

STEEL WING CO., LTD. (formerly Krieger Electric Carriage Syndicate, Ltd.).—H. W. D. Saper, of 7, Great Winchester Street, E.C., as Receiver and Manager on Dec. 7th, 1920, under powers contained in mortgage dated July 29th, 1920.

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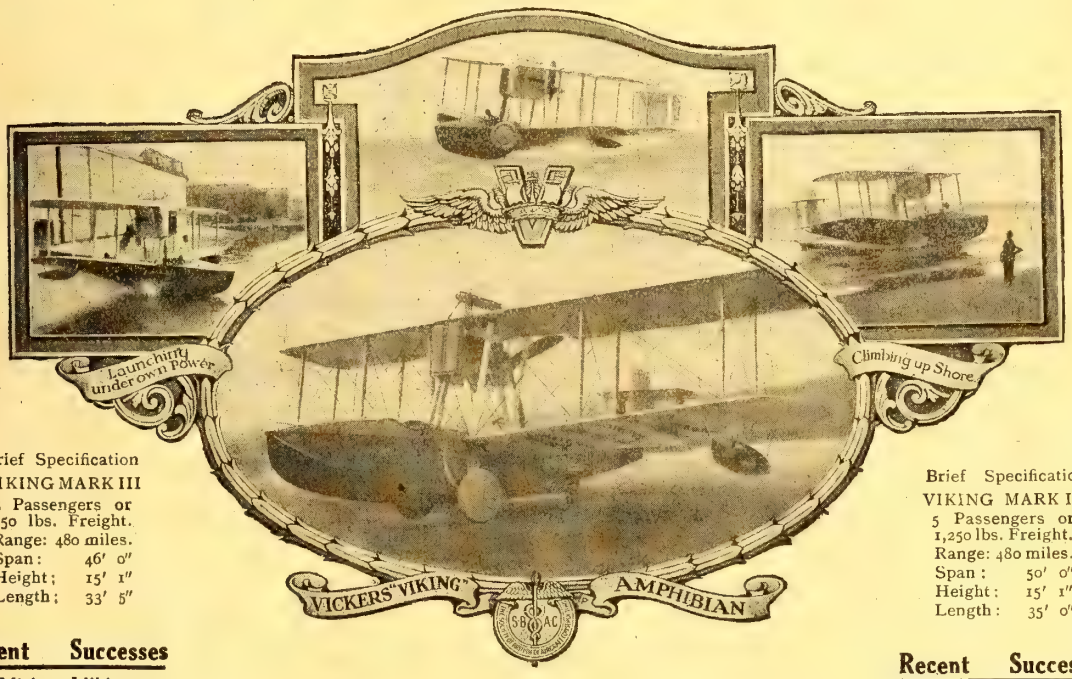

Brief Specification
VIKING MARK III
5 Passengers or 750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height; 15′ 1″
Length; 33′ 5″

Brief Specification
VIKING MARK IV
5 Passengers or 1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

Recent Successes

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

Depôts:

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BRISTOL—55, Park Street. BELFAST—26a, Arthur Street.
LEEDS—Greek Street Chambers, Park Row.
NORWICH—16, White Lion Street.

Recent Successes

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September. 1920.

Aviation Department,
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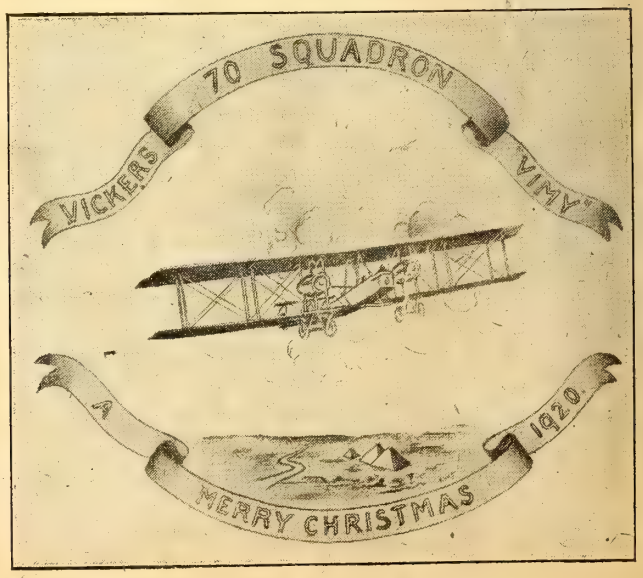
CHRISTMAS GREETINGS FROM AVIATORS.

FROM 20 SQUADRON, R.A.F., IN INDIA.—Pir Ghal Aerodrome in Waziristan. A sample of the country over which the R.A.F. operates on active service.

From 202 Squadron (Seaplanes), Egypt.

From the Aeroplane Experiment Establishment.

From the P.O. Flygkompani, Barkaby, Sweden.



From 70 Squadron, Egypt.

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	The DH16 "Limousine."	The DH18 "Limousine."
ENGINE	450 H.P. Napier Lion.	450 H.P. Napier Lion.
SPEED (Fully Loaded)	136 M.P.H.	128 M.P.H.
ENDURANCE	4¼ Hours.	5 Hours.
USEFUL LOAD	4 Passengers. (or 800-900 lbs of Freight in 84½ cubic feet).	8 Passengers. (or 2,200 lbs of Freight in 255¾ cubic feet).

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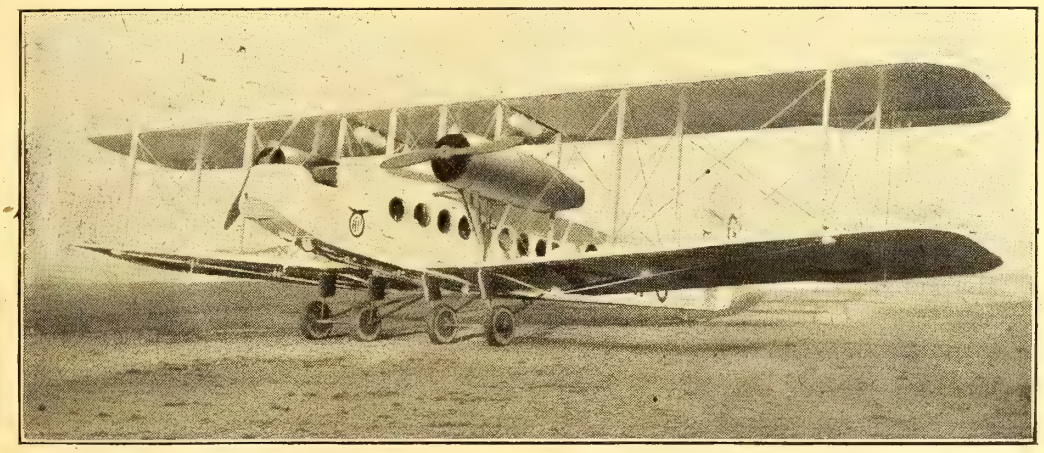

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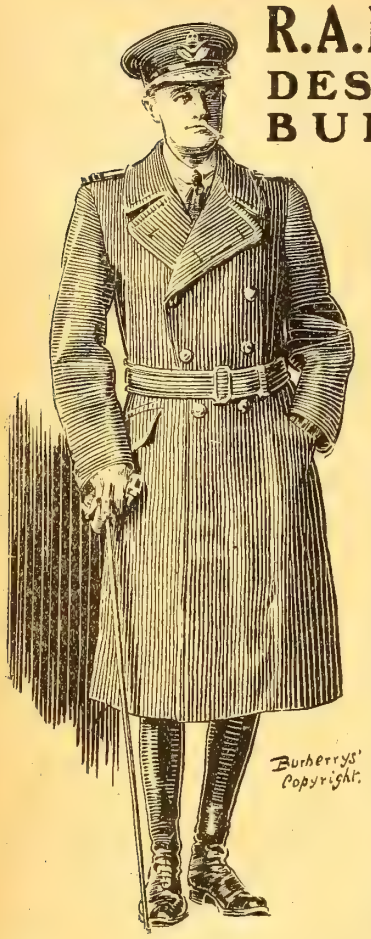

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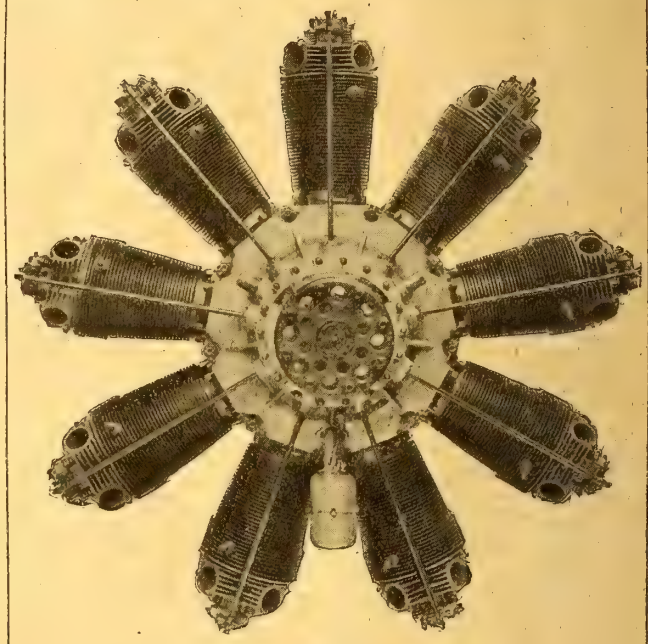

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(*Continued from p. 952.*)

The Reasonable Ghost.

Desmond Arthur was rather by way of being a friend of mine. He was a little black-haired, gray-eyed Celt from the County Clare, a thorough sportsman, but, like all his type, given to extremes of elation and depression, and in the latter state he often gave one the impression of being what the Scots call "fey." Also, like all his type, he had a keen sense of his personal honour. Altogether he was a singularly lovable person, though very distinctly weird and, in the current phrase of to-day, "psychic."

Now in the light of the facts set forth hereinbefore consider them all in relation to one another. Then the Montrose Ghost will be recognised as a most reasonable and rational being.

Desmond Arthur was killed in May, 1913. The Royal Aero Club's Accident Committee made it clear that he was the victim of a crime, so he rested in peace.

In August, 1916, more than three years after his death, there appears this precious Interim Report of the Enquiry Committee which suggests very distinctly that there was no crime and that he was killed through his own incompetence, or foolishness, or recklessness. This was very evidently a reflection on his personal honour, and must be refuted.

Seeing that the Interim Report was merely *interim* he took no direct action in the matter, pending the appearance of the Final Report.

This Final Report was dated Nov. 17th, 1916, and therefore must have been in its final form before going to the printers some time in October. The Committee as a whole had neglected to make amends to him, and apparently he knew it. Consequently he endeavoured to communicate with the officers of his old Corps, the R.F.C., at his old station, the Old Mess at Montrose, to see what he could get them to do about it. Unfortunately, none of them being an Oliver Lodge or a Conan Doyle, he was unable to make them understand what he wanted, and only succeeded in making them uneasy.

Nevertheless, he persevered in his efforts to communicate his wishes from the time when that ungenerous, or disingenuous, Final Report was in being and ready for printing until it finally appeared in the public Press with the addition of the honourable addendum by Messrs. Bright and Butcher, which cleared his good name as a flying officer.

It seems possible that the long delay between the official date of the Final Report (Nov. 17th) and its publication at Christmas, 1916, was caused by waiting for this addendum by Messrs. Bright and Butcher, and perhaps sundry other very valuable technical addenda by Mr. Bright alone. At any rate, the fact remains that the delay occurred, and that it was during this period that the Ghost visited the Old Mess persistently.

If my memory serves me aright, the Ghost paid a final visit in January, 1917, after the Report plus the addendum had been published. It may be assumed that this was only an endeavour on Desmond Arthur's part to tell his brother officers that the affair was now ended to his satisfaction, and possibly to express his regrets for any inconvenience his previous visits may have caused them.

Since then, so far as I can learn, nobody at Montrose has seen, heard, or felt anything of the Ghost. Thus it may be taken that the soul of Desmond Arthur is at peace. *Requiescat.*

Envoi.

Like my friends the doctors, I neither believe nor disbelieve in ghosts. There are so many inexplicable facts in our existence, and so many strange discoveries are being made day by day, that anything may be possible. Therefore I merely set down the facts as they came to my knowledge from various sources.

Those concerned with the appearances at Montrose are now scattered over the face of the world. But I hope that this explanation of what perhaps still seems to them an inexplicable affair may come to their notice and may afford them some satisfaction if their minds are at all uneasy. And, so far as Desmond Arthur is concerned, I feel sure he will be glad to have his part in the business put on a rational basis.

I am prepared to have this explanation controverted. If anybody can find a better explanation I shall be glad to hear it. Meantime I present it for what it is worth to those who are interested in psychical research.— C. G. G.

NAVAL AND MILITARY AERONAUTICS.

King Albert of Belgium and the D.F.C.

It is reported from Brussels that the Duke of York will visit Belgium early in the New Year to present to King Albert the Distinguished Flying Cross in recognition of his Military Flying during the War. In no case has the recipient of a D.F.C. deserved it better.

NAVAL.

ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

Sept. 24th.—Act Lieut.—F B. Bingham, to *Eagle*, Sept. 22nd.

Sept. 28th.—Lieut.-Comdr.—H. H. G. Begbie, to *Ganges*, for Shotley Barracks, in charge of new entries and the Kite Balloon Station, Sept. 30th.

Oct. 4th.—Commr.—D. Faviell, to *Ark Royal*, in command, on arrival in England (undated).

Oct. 7th.—Surgn. Commr.—A J. Wernet, M.B, to *Furious*, Oct. 18th.

Commd Gunner.—J Scott, to *Ark Royal* (undated).

Nov 5th.—Payr Mid.—D. S. Wareham, to *Eagle*, Nov. 3rd.

Nov. 13th.—Engr. Lieut. H. Hargreaves, to *Argus* (Nov. 12th).

Nov. 22nd.—Payr. Lieut.-Commr.—R. J. Cosway, to *Argus* (on recommissioning)

Payr. Lieut.—A. E. Beall, to *Argus* (on recommissioning).

Nov. 27th.—Commd. Engr.—J R. Sunderland, to *Ark Royal*, Dec. 29th.

Dec. 4th.—Commd. Engr.—J. W. Turner, to *Argus* (Dec. 29th).

Dec. 7th.—Commr.—J. C. Wauchope, to *Argus* (Dec. 15th).

Lieut.—F. S. Martin, to *Furious* (Dec. 31st).

Dec. 8th.—Lieut.—R. L. Stuart (act.), to *Argus*, on recommg. (Jan. 3rd).

Dec. 14th.—Lieut.—A. E. Hicks (act.), to *Eagle* (temp.), Dec. 17th.

Act. Wt. Engr.—W. J. M. Paddon, to *Argus* (on recommg.).

Dec. 23rd.—Act. Lieut.—G. F. J. Gould, to *Eagle*, Dec. 31st.

Commd. Bosn.—H. R. Hicks, to *Argus*, on recommg., Jan. 13th.

AIR FORCE.

The Royal Air Force Cadet College.

The following are declared by the Civil Service Commissioners to be the successful candidates at the competitive examination held in November, 1920, for Cadetships at the Royal Air Force Cadet College; but their admission is conditional on their having passed the medical examination. A table of marks will be sent to each candidate as soon as possible:—

*Gillmore, V. O.	10761	Cator, F. G.	9375
Randle, G. H.	9753	Carter, R. H.	9374
Newall, J. S.	9627	Nicholetts, G. E.	8486
*Lewes, R.	8060	Brown, R. C. J. H.	6543
MacGregor, P. J.	7955	Sloan, W. J. P.	5913
Fitzmaurice, M. J.	7793	Burkinyoung, E. H.	5793
*Apthorp, D. F. A.	7258	Jordan, R. B.	5608
*Goldsmid, F. F. R.	7255	Nuttall, F. E.	5375
*Carter, N.	7169	*Harris, F. S.	5167
*Tracy, J. McL.	6718	Fressanges, F. J.	5052

HONORARY KING'S CADETS WHO HAVE QUALIFIED.

Berridge, T. D.	7201	Lywood, R. W. G.	5329

*These candidates have received marks for military efficiency.

100 Squadron R.A.F. Annual Dinner (1921).

A reunion dinner for officers and other ranks of 100 Squadron, R.A.F., will be held at the Hotel Russell, Russell Square, Bloomsbury, on Friday, Jan. 21st, at 7.30 p.m. Price, 15s. officers; 7s. 6d. other ranks; exclusive of drinks. Dress optional.

Will those old members wishing to attend please communicate by Jan. 4th, forwarding subscriptions, to Wing Commander M. G. Christie, C.M.G., D.S.O., M.C., Room 569, Empire House, Kingsway.

The R.A.F. Club.

The following notice appeared in the advertisement columns of the *Times* on Dec. 28th:—

Having regard to the progress that has been made in building operations at 128, Piccadilly, it is hoped that it may be possible to open this portion of the new Club House, including 40 bedrooms, members,' ladies,' and private dining-rooms, together with other public rooms, in the early summer of 1921, providing no further delays are caused by unforeseen circumstances.

R.A.F. Rugby.

On Dec. 27th the Harlequins beat the R.A.F. at Queen's Club by three goals and three tries (24 points) to two (6 points). The following day (Tuesday) Leicester was met at Leicester.

A Presentation.

A Le Rhône aero engine has been presented to Harrow School in memory of Lieut. Melville Allen, R.F.C., who was accidentally killed on March 21st, 1917, while flying.

MORE POSTAL VIEWS.

The following letter was received from the General Post Office, dated Nov. 15th, 1920:—

"Sir,—With reference to your further letter of the 23rd ultimo, I am directed by the Postmaster-General to state that, according to information received from the German Post Office, the Air Mail Service between Amsterdam and Copenhagen, like that between London and Amsterdam, was suspended on the 1st instant for the winter months. When these two services are resumed the question of using the service from Amsterdam to Copenhagen in conjunction with the service from London to Amsterdam for the transmission of Air Mails from this country for Denmark and Scandinavia will be borne in mind.

"As regards the last paragraph of your letter, I am to inform you that the experience of this Office has shown that the demand of the public in this country for Air Mail Services is not at present sufficient to enable this Department to maintain without loss Air Services which the companies concerned do not find it worth while to maintain for ordinary commercial purposes.

"(Signed) L. SIMON, for the Secretary."

With reference to the first paragraph, one can only hope that the remaining air line will survive until "these two services are resumed." It will certainly not be the fault of any British Government Department if they do so. As regards the last paragraph, the following letter was sent from this office on Nov. 17th to the Secretary, the General Post Office :—

"Sir,—I have the honour to acknowledge your letter of Nov. 15th, reference number 211536/20. With regard to the last paragraph I venture to suggest that the Postal Department can scarcely expect the public in this country to use the various air postal lines when the existence of these lines and the benefits of Air Mail Services is so skilfully hidden from the public.

"I think you will admit that if public services of all kinds waited for *public demand* they would never come into existence at all. In other cases, such as railways, motor 'buses, parcel posts, and so forth, it is the supply which has created the demand and not the demand which has created the supply.

"If Air Mail Services were established on an adequate scale and were properly run, and if the public were informed as to their existence, there would be but little difficulty in running such air services without loss.

"My personal experience is that neither in Paris nor in London are letters which arrived by the midday air mail delivered the same evening, consequently it is just as quick to send them by train and boat.

"Furthermore, owing to the inadequate way in which the Press has been handled in communicating facts about air mails the vast majority of people in this country do not know that air mails exist at all.

"Also the officials in the ordinary branch Post Offices are either very badly supplied with information from headquarters, or are too unintelligent to realise that air mail business is worth encouraging in the interests of the rebuilding of British industry, for in no case have I yet discovered a branch Post Office where any of the officials know anything whatever about Air Mails.

"Moreover, it is only occasionally that one is able to obtain the blue Air Mail stamps, without which apparently letters marked AIR MAIL are liable to considerable delay in despatch.

"I am given to understand that the Postmaster-General personally is interested in Air Mail work and believes in it as an aid to speeding up business communications. One can only assume that the Postmaster-General is the only postal official who is thus interested.

"It may be of interest to you to note that Germany is still running with great success Air Mail Lines between Holland and various German towns. Thus the Germans, in spite of their disorganised railways, maintain rapid commercial communication with Holland, which we have deliberately sacrificed."

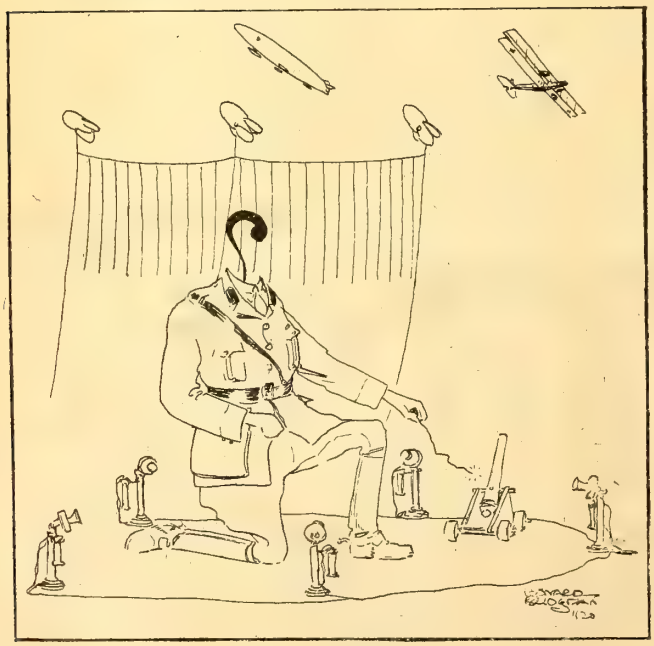
"ONES'-SELVES."

The Staff of "The Aeroplane" depicted by the untamed artist who perpetrates this paper's various artistic outrages. As a matter of respect for the long-suffering readers, the said artist has kindly refrained from drawing the faces of the Staff, and has contented himself with showing-up their bodily and mental peculiarities as they appear to him. The identity of each may be gathered from the more or less well-known initials beneath the sketches.

"One C. G. G."

G. D.

W. H. S.



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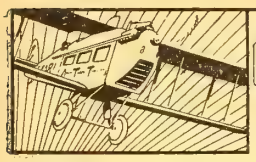
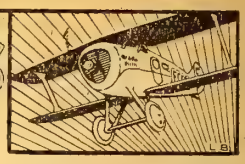


COMMERCIAL AERONAUTICS
AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A. — Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

DECEMBER 20th:

I.A.L. "Vimy," G-EASI, London-Paris, 12.28-15.35, G., 4, Barnard & 1.
M.A., Salmson, F-OCGT, London-Paris, 12.48—, Nil Nil, Mauler.
M.A., Salmson, F-CMAN, London-Paris, 12.52—, Nil, Nil, Charpentier.
M.A., Breguet, F-CMAI, Paris-London, —13.27, G., Nil, Martel.
S.N.E.T.A., DH4, O-BABI, Brussels-London, —15.05, G., Nil, Briere.
A.T.T., DH16, G-EASW, St. Inglevert-London, 14.00-15.05, Nil, Nil, Lines

DECEMBER 21st:

NIL.

DECEMBER 22nd:

M.A., Breguet, F-CMAI, London-Paris, 13.15-15.35, G.&M., 2, Martel.
S.N.E.T.A., DH4, O-BABI, London-Brussels, 13.35-15.25, G.&M., Nil, Briere.
N.L.A., Sopwith, "Dove," G-EAFI, London-Stockholm, 15.30—, Nil, Nil, Gosta Andree.
M.A., Breguet, F-CMAG, Paris-London, 10.40-14.42, G., Nil, Challoux.
I.A.L., "Vimy," G-EASI, Paris-London, 12.40-15.45, G., 2, Barnard & 1.
M.A., Spad, F-CMAY, Paris-London, 13.10-15.47, G.&M., Nil, Le Sec.

DECEMBER 23rd:

NIL.

DECEMBER 24th:

NIL.

DECEMBER 25th:

M.A., Breguet, F-CMAG, London-Paris, 13.55—, Nil, Nil, Martel.
M.A., Spad, F-CMAY, London-Paris, 10.55-13.29, Nil, Nil, Le Sec.

DECEMBER 26th:

M.A., Breguet, F-CMAH, Paris-London, 10.53-13.30, G., Nil, Le Men.
M.A., Breguet, F-CMAC, Paris-London, 12.25-15.07, G., Nil, Charpentier.

The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

DECEMBER 20th:

H.P.T., DH4a, G-EAVL, London-Paris, 10.10, landed St. Inglevert, Nil, Nil, ——

DECEMBER 21st:

NIL.

DECEMBER 22nd:

S.N.E.T.A., DH4, O-BATO, London-Brussels, —15.10, Nil, nil, ——

DECEMBER 23rd:

H.P.T., HP, G-EATK, London-Paris, 12.33, landed Abbeville, G., 1, ——

DECEMBER 24th:

NIL.

DECEMBER 25th:

NIL.

DECEMBER 26th:

NIL.

Air Port Statistics.

CONTINENTAL

MACHINES:					
	Croydon	16	Cricklewood	3	Total 19
PERSONNEL.—Passengers:					
	Croydon	8	Cricklewood	1	Total 9
Crews:					
	Croydon	14	Cricklewood	4	Total 18
					Total Personnel 27

Inland Flying at Croydon.

Dec. 20th.—M.A., Salmson, 1 test (Charpentier); M.W.T.C., DH6, 1 test (Lovell); L.A.S. DH6, Leatherhead return (Muir).
Dec. 21st.—Nil.
Dec. 22nd.—N.L.A., Sopwith "Dove" from Weybridge (Gosta Andree); M.W.T.C., DH6, 2 tests (Lovell).
Dec. 23rd and 24th.—Nil.
Dec. 25th.—L.A.S., DH6, from Leatherhead, joy-riding (Muir).
Dec. 26th.—L.A.S., DH6, joyriding, and to Leatherhead (Muir).

The Air Port of Croydon.

Considering the time of year and the fact that it was Christmas week, there has been quite a lot of work. Gosta Andree, a Swedish pilot, flew over from Brooklands on Wednesday on a Sopwith "Dove," en route for Stockholm. He obtained Customs clearance and proceeded to Lympne, whence he crossed to Belgium the following day. He is taking the machine to a Norwegian company. Quite a summery touch was added to the proceedings by the awakening of the Instone "Vimy" which, aroused from its dormouse-like sleep, leaped across to Paris on Monday and returned on Wednesday. Mr. Barnard was at the wheel.

Mr. Sam Lovell was handling the joy-stick of his "wireless" D.H.6 during the week, and with equal skill he handled a hockey stick during the Christmas holidays.

A belated A. T. and T. machine came in from a forced landing and a large number of French and Belgian machines appeared. The papers are complaining that it is a great waste of money to keep the aerodrome going for foreign companies only, forgetting that every country must have its official air port and that, incidentally, the air Customs duties form quite a considerable revenue.

Mr. Muir was flying on the Leatherhead Aviation Services D.H.6 during the Christmas holiday, carrying a considerable number of passengers. One particularly wishes him and his company success with their joy-riding during the New Year.

G. D.

The Airship Line.

It is understood that the following ships are being refitted and will shortly be re-issued, air lines for the use of, England and Egypt between:—R.36, R.37, L.71, L.64.

R.33 will be used for mooring out tests. Major E. W. Fuller has been appointed C.A.T.O. at Pulham, and Major G. H. Scott will be responsible for flying duties. The first experiments will be carried out early in January.

Brooklands.

On Wednesday, Dec. 22nd, Lieut. Andree, a Swedish pilot, started from Brooklands on a flight to Stockholm in a Sopwith "Dove" (100-h.p. Le Rhône). His time of departure was approximately 11.30, and according to reports the machine got away well. Lieut. Andree carried no passenger. He headed for Croydon (Waddon) Aerodrome, where he would obtain his clearance certificate, and intended visiting Lympne Aerodrome before leaving England. He had only been staying at Weybridge for two days, while the machine was being "tuned up."

It is expected that the construction of the Viking Mark IV will be commenced after Christmas, the drawings being complete.

Captain Cockerell and Captain Broome, D.F.C., disguised as golliwogs, attended a party which was given recently by the heads of the Vickers (Brooklands) Works to the children of the employees, and presented Christmas gifts. Master Leo Maxwell-Muller, son of the superintendent, Mr P. Maxwell-Muller, was also similarly disguised. Among those present were Mr. and Mrs. P. Maxwell-Muller, Mr. A. Knight (works manager), and Mr. and Mrs. Dunbar. This party is given annually by the firm.

Further evidence of the fact that the employees are well catered for on the social and recreative side is given by the fact that in connection with the works there are men's football and women's hockey clubs, cricket and other athletic clubs, literary, musical, dramatic, and social clubs, and in addition a well-equipped rifle range.

One continues to observe Armstrong-Whitworth F.K.8s being removed from Brooklands by road, but nobody seems to be informed as to their destination. The aerodrome appears to be an inexhaustable store for these machines.

J. F. S.

AIRCRAFT IN PARLIAMENT

HOUSE OF LORDS.

AIR NAVIGATION BILL.

On Dec. 22nd the House considered the Commons' amendments to the Air Navigation Bill.

LORD MONTAGU of BEAULIEU said he thought the time had come when they should get the co-operation of Germany and Austria in extending international aviation. If we were to have a direct route to India we must pass over those countries.

The MARQUESS of LONDONDERRY said the question was receiving very sympathetic consideration, but the noble lord was aware that the view he had put forward was not universally held on the Continent of Europe. However, the matter was continually before those responsible for the Convention, and, while it was not possible for the Government to hold out any hopes, everything possible was being done.

The Commons' amendments were agreed to.

* * *

HOUSE OF COMMONS.

Dec. 20th.—The following oral answer was given:—

ROYAL AIR FORCE.

Sir F. HALL asked the Prime Minister what economy would be effected by amalgamating the War and Air Services; and if, in view of the urgent need for economy and the technical advantages of such a course, the Government would appoint a Select Committee of the House to go into the matter?

The PRIME MINISTER, replying, said that the considered policy of the Government is to maintain a separate Air Service. The reason for this could be fully discussed when the Air Estimates are presented next year.

Replying to interjections from Major-General Seely, the PRIME MINISTER said that the matter of a separate Air Minister had been fully discussed and that the Government did not take quite the same view as did the honourable member.

Major-General SEELY asked the Prime Minister to deny that the Navy was seriously concerned with the lack of air power they got under present arrangements. The PRIME MINISTER replied that the First Lord of the Admiralty had expressed himself completely satisfied with the arrangements.

Major-General SEELY: On that point, I am sure the right hon. Gentleman was not present at the Debate, at which the First Lord of the Admiralty stated exactly the opposite, and said that it was a temporary arrangement, which would not continue.

Mr. SPEAKER: No replies to Government answers are permitted at Question Time

* * *

Dec. 21st.—The following written answer was given:—

R.A.F. (AERO ENGINES).

Mr. CHURCHILL, in reply to Capt. Bowyer, said: The approximate total cost of the engines taken delivery of since the Armistice is £15,000,000. Engines of certain types have been retained for the use of the Service, others have been disposed of to Dominion Governments or handed over to the Disposal Board of the Ministry of Munitions.

The figure 14,800 is not that of the number of engines on order at the time of the Armistice, which was much greater—it is the number which the contractors were allowed to complete under their contracts. It is impossible to say how many of these engines had not been commenced at the date of Armistice, but in every case the Liquidation Committee of the Ministry of Munitions settled on the best terms available, the number of engines to be completed, and the compensation to be paid for cancellations.

* * *

ROYAL ASSENT.

Dec. 23rd.—Mr. SPEAKER announced that the Royal Assent was authorised to the Air Navigation Act, 1920.

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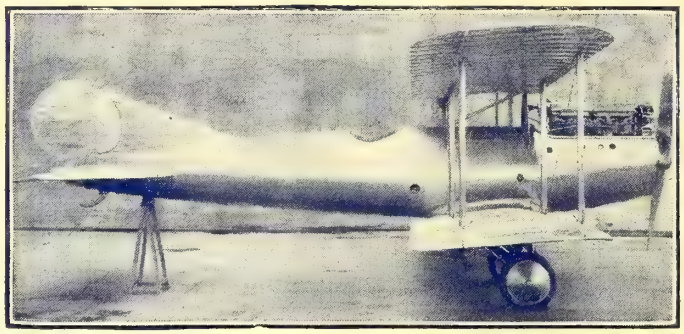

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